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# A history of irrigation in western Nebraska

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A HISTORY OF  
IRRIGATION IN  
WESTERN NEBRASKA

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31

A Thesis  
Presented to  
the Faculty of the Department of History  
University of Omaha

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In Partial Fulfillment  
of the Requirements for the Degree  
Master of Arts

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by  
Thurlan W. Wendell

March 1959

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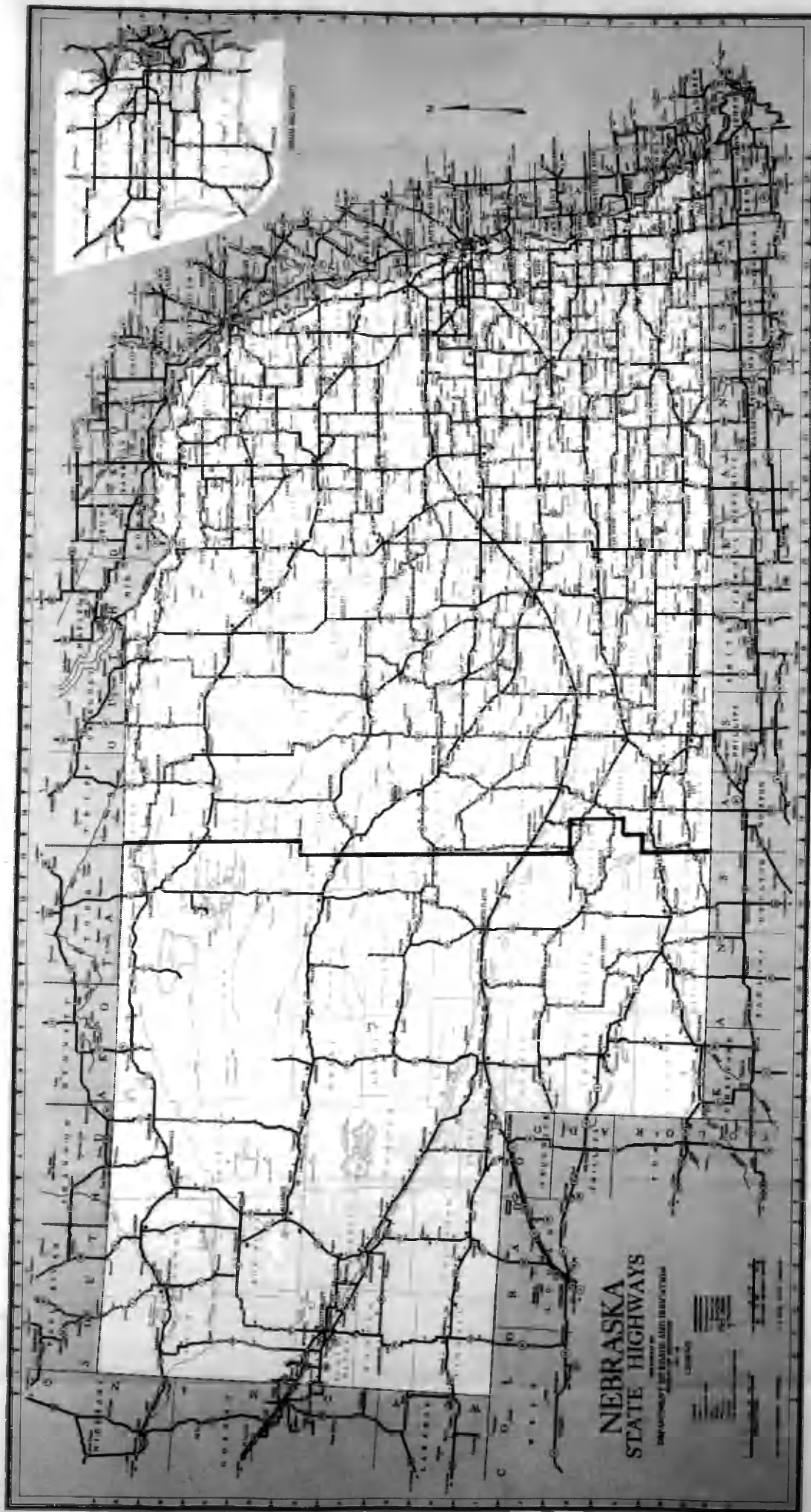
## CHAPTER I.

### INTRODUCTION

Much of the history of Nebraska, and especially the history of western Nebraska, is a story of the search for water. The settler in western Nebraska did not find farming an easy or pleasant task and seldom did he find adequate moisture. The early settler found nature a firm and unrelenting force. The winds blew constantly and when the rains came they usually came in the form of a deluge washing the land barren and leaving it "gullied" with canyons. Frequently the rains were accompanied by severe hail storms - storms which pounded the crops into the earth as though a maddened giant had trampled them.)

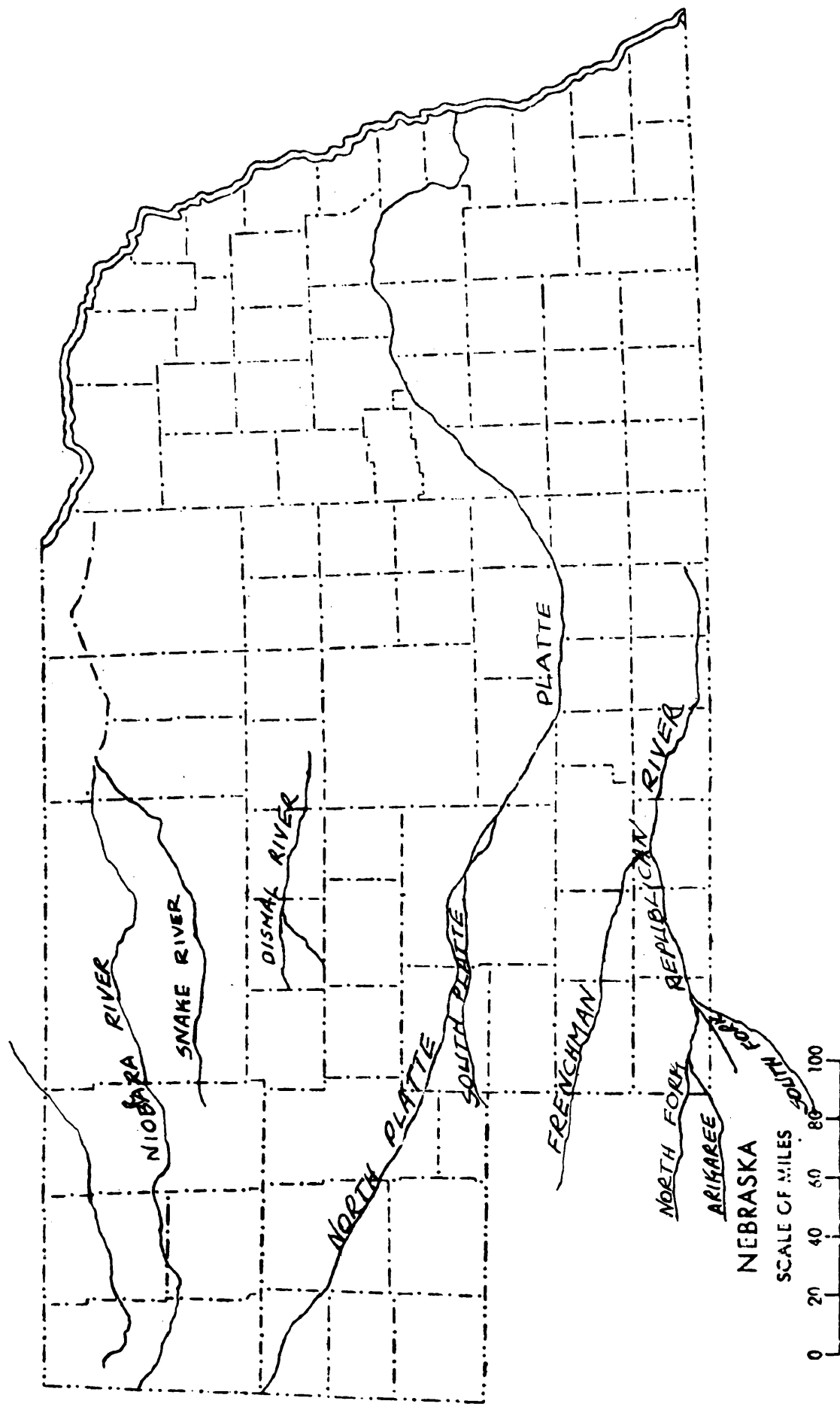
An attempt will be made in this thesis to tell the story of irrigation in the twenty-seven western counties of Nebraska. This area includes the counties of Sioux, Scottsbluff, Banner, Kimball, Dawes, Box Butte, Morrill, Cheyenne, Sheridan, Garden, Deuel, Cherry, Grant, Arthur, Keith, Perkins, Chase, Dundy, Hooker, McPherson, Lincoln, Hayes, Hitchcock, Thomas, Logan, Frontier, and Red Willow. Brown County will also be discussed to some extent in that the Ainsworth Unit, a recent development, and economically as well as historically a part of western Nebraska, is a part of the "irrigation story". (See Map No. 1 Page 2.)

Irrigation was not readily accepted, as the early Nebraska farmer usually transplanted from the Mississippi Valley found it hard to



NEBRASKA  
POPULATION 1950 - 1960  
INDEX

County	1950	1960
Adair	1,234	1,345
Adams	2,345	2,456
Agate	3,456	3,567
Antelope	4,567	4,678
Arthur	5,678	5,789
Asa	6,789	6,890
Aurora	7,890	7,901
Bartholomew	8,901	8,012
Barton	9,012	9,123
Benning	10,123	10,234
Berkeley	11,234	11,345
Bethany	12,345	12,456
Beverly	13,456	13,567
Brewster	14,567	14,678
Brown	15,678	15,789
Burns	16,789	16,890
Butler	17,890	17,901
Calderwood	18,901	18,012
Callaway	19,012	19,123
Carroll	20,123	20,234
Cass	21,234	21,345
Cedar	22,345	22,456
Chadron	23,456	23,567
Cherokee	24,567	24,678
Cherry	25,678	25,789
Clatsop	26,789	26,890
Clay	27,890	27,901
Clearwater	28,901	28,012
Colfax	29,012	29,123
Conkling	30,123	30,234
Cook	31,234	31,345
Cottonwood	32,345	32,456
Crawford	33,456	33,567
Cumby	34,567	34,678
Cyprus	35,678	35,789
Dallas	36,789	36,890
Dawson	37,890	37,901
Deuel	38,901	38,012
Dodge	39,012	39,123
Dundy	40,123	40,234
Dwight	41,234	41,345
Elbert	42,345	42,456
Ellis	43,456	43,567
Emery	44,567	44,678
Franklin	45,678	45,789
Furness	46,789	46,890
Gallatin	47,890	47,901
Gardner	48,901	48,012
Gesler	49,012	49,123
Gibson	50,123	50,234
Graham	51,234	51,345
Grant	52,345	52,456
Grant	53,456	53,567
Grant	54,567	54,678
Grant	55,678	55,789
Grant	56,789	56,890
Grant	57,890	57,901
Grant	58,901	58,012
Grant	59,012	59,123
Grant	60,123	60,234
Grant	61,234	61,345
Grant	62,345	62,456
Grant	63,456	63,567
Grant	64,567	64,678
Grant	65,678	65,789
Grant	66,789	66,890
Grant	67,890	67,901
Grant	68,901	68,012
Grant	69,012	69,123
Grant	70,123	70,234
Grant	71,234	71,345
Grant	72,345	72,456
Grant	73,456	73,567
Grant	74,567	74,678
Grant	75,678	75,789
Grant	76,789	76,890
Grant	77,890	77,901
Grant	78,901	78,012
Grant	79,012	79,123
Grant	80,123	80,234
Grant	81,234	81,345
Grant	82,345	82,456
Grant	83,456	83,567
Grant	84,567	84,678
Grant	85,678	85,789
Grant	86,789	86,890
Grant	87,890	87,901
Grant	88,901	88,012
Grant	89,012	89,123
Grant	90,123	90,234
Grant	91,234	91,345
Grant	92,345	92,456
Grant	93,456	93,567
Grant	94,567	94,678
Grant	95,678	95,789
Grant	96,789	96,890
Grant	97,890	97,901
Grant	98,901	98,012
Grant	99,012	99,123
Grant	100,123	100,234



believe that the plow could not cure all ills of the land. He attempted to farm the land just as he had farmed in the Mississippi Valley and later the Missouri Valley. When the drouths came, and in Western Nebraska they came frequently, the farmer either starved or went back home to start anew in the east. Those few hardy souls who stayed soon came to realize that if an agricultural society was to prosper in the region a means had to be found to sustain crops. Irrigation was that answer.

Irrigation started as an individual action, then developed into a group movement. Before long it was found that the job was too big for either the individual, the group, or even the State. At this point, about 1900, the movement for federal intervention began. The story of irrigation in Nebraska is one of trial and error, of frustration, and finally of success.

This brief, and certainly not complete, history attempts to trace the story of the water usage on the land, its benefits, economically, as well as the story of its contribution toward recreation in the region. It begins with the first Nebraska irrigator, John Burke, of Lincoln County, and concludes with the new Ainsworth Unit Project. It attempts to tell the story of the use Nebraskans have made of the western streams including the North and South Platte, Niobrara, Snake, Frenchman, Arikaree, and Republican Rivers. (See Map No. 2 Opp. Page 3)

## CHAPTER II.

### EARLY IRRIGATION DEVELOPMENT

The history of irrigation in Nebraska dates from the year 1866 when John Burke built a small ditch on the south side of the river east of the city of North Platte.) This was near Fort McPherson, and evidence indicates Mr. Burke raised vegetables and corn which he sold to the soldiers at the Fort.<sup>1</sup>

The need for irrigation in this area was pointed out to the people as early as 1867 when a government geologist, in his report on western Nebraska said:

It is evident that the western portion of the state must remain unsettled or be inhabited sparsely by a people devoted to pastoral pursuits. It is a well known fact that the same hills on other portions of the west that appear the most sterile or the most deficient in wood and water, are the favorite resorts of the wild game, and that they become exceedingly fat. The short grasses that grow on these supposed arid, sterile plains seem to suit the palates of the wild animals and they find sufficient water at all times of the year. I would infer from that fact that it may yet become a fine stock growing country and aided by the facilities of market that will be furnished by the Union Pacific Railroad, I cannot but believe that some of the finest wool in America will one day reach our market from western Nebraska.<sup>2</sup>

Here was a warning to future Nebraskans that this region should

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<sup>1</sup>  
R. H. Willis, Irrigation in Nebraska, (State of Nebraska Department of Roads and Irrigation, Lincoln, Nebraska, 1950-1951), p. 17.

<sup>2</sup>  
Dr. Charles E. Bessey, Fifteenth Annual Report in Semi-Weekly State Journal [Lincoln, Nebraska], January 14, 1902.

not be turned over by the plow, and to farm it using the experience of Mississippi Valley farming could only bring disaster.

Probably the first official warning concerning the arid conditions of this area came from Major Stephen H. Long. When Major Long returned from his expedition to the Rocky Mountains in 1820, he confirmed what many Americans had suspected all along-- that much of the area between the Missouri River and the Rocky Mountains was a vast desert wasteland.<sup>3</sup>

When Major Long submitted his report he had only his ability as an observer on which to rely. He reported the area as he saw it and others coming through on the Oregon Trail -- and perhaps going through during a wet period -- found room to disagree. The hills, as has since been discovered, can be green one week and "burned to a cinder" the next.

Nebraska climate is determined by, (1) its central position on the American continent, (2) its altitude above sea level, (3) its relation to the great plains stretching from Hudson Bay to the Gulf of Mexico, (4) the mountain ranges between these plains and the

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<sup>3</sup> James C. Olson, History of Nebraska (Lincoln: University of Nebraska Press, 1955), p. 3.

Pacific Ocean, (5) and, modification of the foregoing arising from  
terrestrial and astronomical changes and from the presence of men.

The Nebraska climate has been characterized as one accompanied by winters of considerable severity, summers of unusual warmth, rainfall in limited quantities, marked with sudden change of temperature, large seasonal and daily temperature ranges, and dry salubrious atmosphere, with a small percentage of cloudiness and a large percentage of sunshine. The average wind velocity for the high plains of Nebraska is about ten to twelve miles--twenty-five miles is not uncommon--and a velocity of forty miles and more is recorded a half a dozen or more times every year. In spring, velocities of sixteen to twenty miles an hour are common. The prevailing wind of the year is northwest; but in the spring, the summer and much of the autumn, its predominance is greatly reduced or overcome by south and southwest winds blowing from the Gulf of Mexico. Sometimes the warm winds blow in the winter, causing the snows to melt on what are usually the coldest days of the year. In the summer in seasons of drought, especially in the area under study, the wind from the southwest reaches Nebraska

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<sup>4</sup> Addison Erwin Sheldon, Nebraska - The Land and the People, (Chicago and New York, Lewis Publishing Company, 1931), Vol. I. p. 25.



wrung dry of its moisture and capable of doing great damage.

These destructive winds have occurred at long intervals of years since white settlement. Wet and dry years run in irregular cycles with no sufficient data to formulate a rule for them. Statistics covering the past seventy years show dry cycles in 1860-63, 1890-95, 1910-13.<sup>5</sup>

(Farming, in eastern Nebraska, was established as a way of life during the seventies.) Agricultural settlement, however, except in the Republican Valley, had not extended much west of Grand Island in 1880, and there was considerable land available east of that area.<sup>6</sup> By 1890 agricultural settlement had pushed to the western border of the state and by that time virtually all of the free arable land had been occupied.

(During the decade of the 1870's a total of 19,585,382 acres of public land was taken up. This left approximately 11,000,000 acres still unclaimed but most of this was in the sandhill region.) Professor Olson points out that the Burlington Railroad sold 937,100 acres of its land, most of it in the first four years of the decade; and the Union Pacific, 6,913,539 acres, over four million

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<sup>5</sup> Ibid.

<sup>6</sup> James C. Olson, History of Nebraska, (Lincoln: University of Nebraska Press, 1955) p. 204.

by 1884. He states that much of this activity was purely speculative, but nevertheless farms increased from 63,389 in 1880 to 113,608 in 1890; the improved acreage from 5,504,702 to 15,247,705;<sup>7</sup> and the valuation from \$147,193,123 to \$511,799,810.

Little attention was paid to the people who tried to caution the settler concerning the arid region of western Nebraska. Attempts were made to farm this region in the same manner in which farming was conducted in the Mississippi Valley, and this was only natural. They came from an area where rainfall year after year was bountiful and usually constant. This meant, of course, that they gave little attention at first to irrigation. They were "dry land" farmers, and as such they paid little heed to Major Long's warning.<sup>8</sup> Western Nebraska presented a new frontier. The Union Pacific crossed the area bringing transportation to the region putting it within easy reach of many settlers. As the area settled it became apparent the land could not produce without added moisture.

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<sup>7</sup> Ibid.

<sup>8</sup> Bruce H. Nicoll & Ken R. Keller, Know Nebraska, (Chicago: Johnson Publishing Company, 1951), p. 158.

## CHAPTER III.

### LINCOLN COUNTY

Lincoln County was the first western county in the so called "Great American Desert" to recognize the need for irrigation, and the first to try to do something about it. This county, with North Platte the county seat, was organized in 1860 and reorganized in 1866. It was formerly called Shorter County and was created by an act of the Nebraska legislature in 1859 but was not organized until 1860.<sup>1</sup> It is fifty-four miles in length from east to west and forty-eight miles wide from north to south with an area of 2,592 square miles or 1,658,880 acres. Elevation is about 2,600 feet in the eastern portion and nearly 3,000 feet in the western part. The Platte River flows through the county a little north of the center of the county from north to south and the North Fork some five miles further to the northward. These two rivers flow easterly, parallel for about twenty five miles, when the North Platte pursues a southeastern course, flowing into the South Platte six miles further eastward.<sup>2</sup>

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<sup>1</sup> Ira L. Bare and Will H. McDonald, Lincoln County, Nebraska and Her People, (American Historical Society, Chicago and New York, 1920), p. 1.

<sup>2</sup> Ibid.

It was in this county that John Burke first started irrigation in Nebraska. Lincoln County is typical of irrigated counties in western Nebraska and has shown continued economic growth. Burke as early as 1866 saw the obvious need for irrigation in the area but it was not until 1895 that promoters of the area started a concerted drive to "sell" irrigation to the people. The first mention of irrigation projects, however, was found in the newspaper files of Lincoln County as early as 1870. The following article appeared in the Weekly Independent published at North Platte in 1870:

Work was begun by the Lincoln County Ditch Company on the ditch by which it proposed to water all the land in the valley between the two Platte rivers for a distance of about five miles. The survey was made by Colonel Park, County Surveyor. They take the water from the South Platte River at Section 1, which is about three and one-half miles above the center of town; they propose to run it thence to the northeast corner of Section 6 and thence down the parallel line running east and west between the rivers so that by digging small ditches the water can be run either north or south so that it will irrigate thoroughly all the land in the valley from one-half mile below where the water is taken from the Platte to the junction of the two Platte rivers.<sup>4</sup>

The article continuing in some detail explains the type of system to be used:

The banks of the South Platte, where they began the ditch is three and three-fourths feet high, while there is a fall of seven and one-half feet to the mile for something more than five miles. They bring the water to the level of the

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<sup>4</sup> Cited in Ibid., p. 396.

surface about a half-mile from their starting point. The South Platte at this point is several feet higher than the North Platte, the fall is also greater, which gives it greater natural advantages for irrigation purposes than any other stream in the West. There is no point in the South Platte Valley, in Lincoln County, where water cannot be brought to the surface by means of a ditch in less than one mile.<sup>5</sup>

From the above it appears that some sound planning was being formulated as early as 1870. Between 1870 and 1895, however, irrigation interest was on a "hit or miss" basis. But by 1895 the area, no doubt due to drouth, was again taking an active interest in the benefits of irrigation.

In 1895 the North Platte Semi-Weekly Tribune printed the following editorial:

In the Platte Valley of Lincoln County there is more hidden wealth than in any mining section of Colorado, and yet our people are slow to take advantage of the situation. In this valley, a rich empire within itself, are 500,000 acres of land capable of being irrigated, and of this amount fully one-half is already under ditches now completed or which will be finished this fall. Granting that this land was all under cultivation, and that the revenue desired from the products be placed at the low average of 15 dollars per acre, the yearly value of the products raised within this irrigated section would be \$7,500,000.

These may seem fanciful figures, yet if these lands were brought under a state of intense cultivation, the estimate would be too low instead of too high. But to obtain these results the people of North Platte and the irrigated districts must, in the language of the street gamin, "get a move on them".<sup>6</sup>

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<sup>5</sup> Cited in Ibid., p. 397.

<sup>6</sup> Editorial in the North Platte Semi-Weekly Tribune, August 13, 1895.

The promotional advertisers of today had their counterparts in this area in 1895. It seems that "all stops were pulled" to sell the area to the public. During that year the Lincoln County irrigation association completed arrangements for an exhibit at the State Fair. The fair was held in Omaha and one of the features was the display of irrigated products from Lincoln County. Mr. G. T. Hunt explained the resources and advantages of the valley.<sup>7</sup>

The promoters of the area realized it was necessary to sell investors on the idea that farm diversification was possible. The oft-repeated statement that the area near the 100th meridian began the "Great American Desert" was one not easily overcome. The Kearney Hub in an editorial stated:

Make irrigation the basis of the new agriculture in Nebraska. It will enable the farmer to raise many things that he dare not risk without irrigation. With hay crops and fruit, and dairy-ing, and butter making, and poultry and honey, and enough of the staples to provide merely for his interest payments and working off his principal he will soon get out of debt and once out he will be able to stay out.<sup>8</sup>

Settlers coming to this semi-arid area were inclined to shun irrigation and its many problems. To irrigate meant giving up large

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<sup>7</sup> Ibid. . June 21, 1895 .

<sup>8</sup> Editorial in the Kearney Hub . September 10, 1895.

acreage and concentration on a smaller unit. The slightest encouragement from nature i. e., a rain, or cool weather, caused interest in irrigation to decline. The overall lack of moisture in the area was presented to the settlers almost daily in the hope it would stimulate their interest in irrigation. The Kimball Observer made this admonition to farmers:

Don't let the irrigation fever cool down because we had a good warm rain in February. If we ever have so much rain this season it ought not to slacken our efforts a particle, for the time of great need for irrigation will be upon us before our ditches and reservoirs are ready.<sup>9</sup>

Records of the North Platte signal office for the first six months of 1895 showed the precipitation amounted to 9.73 inches. For the same period of 1894 it was 7.91 inches.<sup>10</sup> With this information constantly before the people the need for irrigation to produce suitable crops would seem obvious. This, however was not the case, for there was a great amount of indifference to the need for established projects.

In March of 1895 an election in the Cozad precinct (immediately east of North Platte), a proposition to issue \$10,000 in bonds in aid

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<sup>9</sup> Editorial in the Kimball Observer March 8, 1895.

<sup>10</sup> North Platte Semi-Weekly Tribune, July 22, 1895.

of the Cozad Irrigation Company resulted in defeat of the bonds. Only 169 votes were polled, of which 94 were in favor of the bonds and 75 against them. This type of bond election to carry required two-thirds of all votes cast to be in favor of the bonds. In this instance the bond supporters fell short just nineteen votes.

The Lexington Pioneer described the situation thus:

The irrigation company is very wroth over the result, claiming to have been promised the bonds and that a number of the leading people of the town of Cozad 'went back on their word.' Last Monday all of the workmen on the canal were taken off and discharged, and there is blood upon the moon. A citizen of Cozad informed the Pioneer scribe that certain parties in the town demanded bounty to the amount of \$1,500 from the irrigation company, and because their offer was spurned they united and worked against the bonds and succeeded in knocking them out.<sup>12</sup>

The problem of building ditches and incorporating large irrigation districts was great. The idea of pump irrigation was advocated in this region at an early date and was used with some success prior to actual ditch irrigation. (In 1895 a windmill and pump could be installed for from \$125 to \$150. During this period by pumping first to a reservoir and then irrigating from the reservoir by a ditch to the fields a total of twenty to thirty acres were irrigated.)<sup>13</sup>

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<sup>11</sup> "Irrigation Notes", in Ibid., March 8, 1895.

<sup>12</sup> Lexington Pioneer, March 8, 1895.

<sup>13</sup> Editorial in the North Platte Semi-Weekly Tribune, May 31, 1895.



Pumping by windmill was advocated as a means to assist the farmer in increasing his income. A Mr. Victor E. Meyers writing in the North Platte Tribune stated:

Everybody who is in possession of a windmill and pump can irrigate from ten to fifteen acres of land, and can make more money from the sale of vegetables, than from the cultivation of a great number of acres of land. He can grow many luxuries, as apples, pears, peaches, grapes and all kinds of berries and vines.<sup>14</sup>

Hence another instance in which the farmer was encouraged to work a small acreage and make himself self-sustaining.

Indeed, discouragement constantly plagued the farmers. This was a new land, a different soil, where the wind blew almost constantly. In 1895 the Lincoln County Immigration Association tried to secure thrifty farmers for the irrigable lands of the Platte Valley. During the period between 1890-1895 a number of farmers trying to dry-farm became discouraged and left the country. In an attempt to forestall this exodus a number of large land owners in the North Platte area expressed a willingness to cut their lands up into twenty acre farms and give the use of it during the season of 1895 free of rental.<sup>15</sup>

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<sup>14</sup> Ibid., April 9, 1895.

<sup>15</sup> The North Platte Semi-Weekly Tribune, May 24, 1895.

One observer reported over two hundred miles of canal had been constructed by 1897 in the area along with one thousand miles of lateral ditches. There were 150,000 acres of uncultivated and unpopulated lands thrown open to settlement about that time and most of these lands were "under" an irrigation ditch.

At this time the following ditches were in existence:

North Platte Canal - twenty five miles long, headed in the North Platte river twenty five miles northwest of North Platte. Most of the land had been sold.

Sutherland & Paxton Canal - headed in Keith County on the North Platte river and followed the north edge of the bluffs as far east as Sutherland, then took a southerly direction through the bluffs and returned west along the southern edge of the bluffs for about three miles. It was thirty miles in length and was fully completed. In 1897 fifteen thousand acres of land under this canal was for sale and ready for immediate irrigation. A large body of especially fine land in the vicinity of Sutherland had been plotted into five acre plots with the idea of introducing intensive farming.

The Farmers and Merchants Canal - headed twenty miles west of North Platte and covered the land in the delta south of the Union Pacific Railway and that land immediately in the vicinity of North Platte. The canal was of vital import to the City of North Platte in that it furnished water for gardens and even lawns.

The Cody and Dillon Canal - headed twelve miles above North Platte and covered, generally, ranch and hay land.

The South Side Canal - headed in the North Platte river twenty six miles from the City of North Platte. It was forty two miles long and crossed the South Platte river by means of a flume. The size of the flume was four by ten feet and was 1,800 feet long. The flume actually was an inverted syphon and was sunk below the river bed. It was made of heavy planking and was estimated to have cost \$15,000.

The Paxton and Hershey Canal - headed twenty-four miles west of North Platte. It was sixteen miles long and handled water for ten thousand acres. A sizeable amount of apples, plums, cherries, and other small fruits were produced under this canal.

The Birdwood Canal - headed in the Birdwood river, north of North Platte, and covered land on the north edge of the valley.

Pawnee Canal - headed in the North Platte river two miles east of North Platte and covered lands of the north side of the valley from where the Birdwood Canal ended to about fifteen miles east.

The Farmers Canal - headed in the Platte below the junction of the two rivers, seven miles east of North Platte. It was thirty miles long and covered the lands on the south side, from where the South Side canal ended. It ran through the United States Military Reservation, at Cottonwood Springs, known as Fort McPherson. The land, about 13,000 acres, was, in 1898, thrown open for settlement by the government.<sup>17</sup>

This same observer further pointed out that the land under these ditches could not be given away or sold at low prices due to the construction costs of the various projects. The success of these projects was limited. For example, the South Side Canal, while established in 1894, was operated only until 1900. During this same year the area received ample rainfall and this, combined with expensive repairs, county road bridges, and difference of opinion among the stockholders in the mutual enterprise caused the abandonment of the enterprise.<sup>18</sup>

Abandonment was the fate of the majority of the mutual irrigation enterprises, but by 1902 interest in irrigation moved westward to

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<sup>17</sup> Ibid.

<sup>18</sup> Ibid.

the upper reaches of the North Platte Valley. While irrigation was practiced continually in Lincoln County as evidenced by John Burke and others, it was not until the drouth of the thirties and the construction of the large federal system that it came to be recognized as a permanent way of life.

## CHAPTER IV

### THE NORTH PLATTE VALLEY

Irrigation in the North Platte Valley did not become active until after the Reclamation Act of 1902--<sup>1</sup> although some small ditches were given water rights prior to that date. The first deed to state land ever given to an irrigation company in the history of Nebraska was, however, issued to the Mitchell Land and Irrigation Company of Scottsbluff County on January 22, 1892.<sup>1</sup> The deed was a modest affair and conveyed title to nineteen acres of land, which at the lowest legal appraisement of seven dollars per acre meant \$182.22 for the state.<sup>2</sup>

Promotion practices in the Valley were similar to those used in Lincoln County. The Nebraska Homestead, a Gering, Nebraska, paper was instrumental in promoting irrigation in this area. The paper placed before its readers a constant stream of comment concerning success of irrigation, especially pointing out the successes experienced by Lincoln County Farmers.

Typical of such articles was the following remark:

In 1887 our own county of Scotts Bluff commenced experimenting with irrigation. There are now over one million acres under

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<sup>1</sup> Daily Nebraska State Journal [Lincoln] January 23, 1892.

<sup>2</sup> Ibid.

irrigation in Nebraska. ) Our rivers have a good free and a liberal supply of water, the best river in the state for this purpose being the North Platte. In fact, no other river in the west affords such water privileges, either in cheapness of getting water from the bed or in abundance....

The average value of irrigated land is about \$83.00 per acre and yield an annual income of \$15.00 per acre. Figuring land value at \$40.00 per acre, and income at \$7.50 per acre we see the great possibilities of our county. Much land that is now comparatively worthless, can, by an expense from \$2 to \$10 per acre for water, be made worth from \$10 to \$100 per acre, or even more.<sup>3</sup>

The Irrigation Age, published in Chicago, presented a glowing picture of irrigation possibilities and advertised in many of the state's newspapers. Typical of the advertisements was this published in the Nebraska Homestead:

There was a time in Kansas when irrigation was considered unnecessary. Today it is considered the only successful method of growing farm and orchard crops. The Irrigation Age is the only journal devoted exclusively to this subject. Single numbers ten cents, one dollar per year. G. E. Girley, Manager, Address, 112 Dearborn Street, Chicago.

Apparently this advertisement referred to irrigation possibilities in the Republican Valley. It is to be noted that reference was made to orchard as well as field crops. The promoters of the western area seemed to dwell on the subject of orchard possibilities obviously ignoring or being unaware of the short growing season, of the late

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<sup>3</sup> The Nebraska [Gering] Homestead, February 12, 1897.

<sup>4</sup> Ibid., January 22, 1897.

spring freezes, and the early fall freezes.

Today the West, California, Oregon, Washington, are great producers of orchard crops, but the North Platte Valley area is sorely lacking in this production. The crops produced today in this area are sugar beets, potatoes, alfalfa, and corn, with a number of irrigated pastures providing an abundant supply of feed for livestock. <sup>5</sup>

The North Platte Valley area seemed to wait until 1902 before great interest in irrigation took firm hold. On June 13, 1902, the National Reclamation Bill, referred to in the area as the "Irrigation Bill" passed the House by a vote of 146 to 55. The Mitchell Index <sup>6</sup> noted that the Nebraska delegation voted for passage of the measure.

With the passage of the Reclamation Act surveys were started on April 1, 1903. It became apparent that storage must be provided in order to reclaim any considerable land area. Investigations led to the selection of a granite canyon about three miles below the junction of the North Platte and Sweetwater Rivers as the most favorable dam site. The project was authorized on March 16, 1903, by the Secretary of the Interior. Pathfinder Dam was completed June 5, 1909.

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<sup>5</sup> Bureau of Reclamation United States Department of Interior. Accomplishments of Irrigation North Platte Project Wyoming - Nebraska. April 1956. Washington: Government Printing Office, 1956.

<sup>6</sup> The Mitchell [Nebraska] Index, June 20, 1902.

Work on the Main Interstate Canal started in July 1905, and the structures of the First Division of the canal were completed in the summer of 1907, permitting localized irrigation during the season<sup>7</sup> of 1908.

Where construction was begun land owners pressed for rapid action. Those on the east end of the project disliked the thought of the west getting water first. They pressed for construction from east to west but since this was not feasible from a construction viewpoint the construction worked down river.

The Minatare Free Press and Sentinel noted this feeling in the following editorial:

It is our understanding that everything connected with the government irrigation project is in the best possible condition. It is true that the dirt is not moving at the eastern extension of the canal, but we are urged by those who are keeping in touch with the project, to furnish the information to the people that very much more is being done by the government and the commission in charge of this special work than is generally supposed...

We believe that at the present time no one part of the work is being selfishly and inconsiderately handled.<sup>8</sup>

Land investment companies enthusiastically proclaimed the new irrigated area. "America's Valley of the Nile" is the title the

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<sup>7</sup> Bureau of Reclamation United States Department of Interior, North Platte Project, Washington Government Printing Office, 1949.

<sup>8</sup> Editorial in the Minatare [Nebraska] Free Press and Sentinel, January 21, 1909.



Payne Investment Company of Omaha gave the irrigated lands of the North Platte Valley. The company sponsored an excursion from Omaha to the area on April 27, 1909, and advertised a special sale<sup>9</sup> of land in parcels of not more than one hundred-sixty acre tracts.

The towns in the valley did their utmost to promote the area and often, in the best style of today's travel-folder language told of the area being advertised. An example:

Why Should I Go to Minatare to Live? The answer to the question is summed up in Horace Greeley's advice to young men to go west and grow up with the country. Scottsbluff County embraces the cream of the territory under the North Platte Valley project.... The climate of the North Platte Valley is dry and bracing, full of ozone, excellent for every kind of throat and lung trouble. The winters seldom become cold before Christmas and are so dry that the same degree of cold is not felt to any such extent as in the lower latitude. The soil is excellent and particularly adapted to all kinds of vegetables and especially to sugar beets and potatoes. While the average is lower the following yields have actually been raised in this valley: Alfalfa 6 tons per acre, potatoes 400 bushels per acre, wheat 50 bushels, onions 800 bushels, cabbage 20 tons, sugar beets 30 tons.<sup>10</sup>

In 1908 land under irrigation ranged in price from thirty-five to one hundred dollars per acre compared to dry land that was to later come "under the ditch" which was selling for twelve to twenty-five dollars per acre. Business lots ranging from one hundred fifty

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<sup>9</sup> Ibid., April 23, 1909.

<sup>10</sup> The Minatare [Nebraska] Free Press and Sentinel, March 26, 1908.

to eight hundred dollars were being sold in Minatare.

The comparatively low price of land during this period is shown in the following advertisement:

4000 acres of deeded land, 1300 acres of school land, 300 acres watered by private ditch, has 100 acres of alfalfa, 30 acres of grove, and two miles of running water, 200 acres of the best wheat grass hay, sub-irrigated. Six-room house, barn 40X80 feet, log shed 200 feet long enclosed. School house on ranch and has telephone connections. Has 40 acres of fence, is 12 miles from Minatare. \$10.00 per acre. Can carry about half at six per cent.<sup>12</sup>

The era of cheap land and the new "government ditch" gave the area a new theory of the old falsely stated "rain follows the plow" theory. Eastern floods were caused by excessive waters in the Platte, <sup>via</sup> was the opinion of the western newspapers. These waters should be stored in reservoirs, but in addition, the fields should be plowed to hold the moisture from reaching the rivers. On this subject one authority comments:

suffice it to say that the waters of every rain storm preserved to the west in reservoirs or the "cisterns" of deeply plowed soil will contribute to the saving of both life and property further east, and there is no surer way of developing the West.<sup>13</sup>

The necessity of plowing deeply was constantly being pressed on the settler:

<sup>11</sup> Ibid.

<sup>12</sup> Ibid.

<sup>13</sup> Ibid., July 16, 1909.

he that plows deep can grow corn, other things being considered. Farmers, land-owners, let the plow develop your country. As you save others you will save yourself.<sup>14</sup>

Deep plowing was advocated, being based no doubt, on Mississippi and Missouri Valley farming methods. The soil, west of the 100th meridian, is of the sandy loam type, and is subject to blowing.

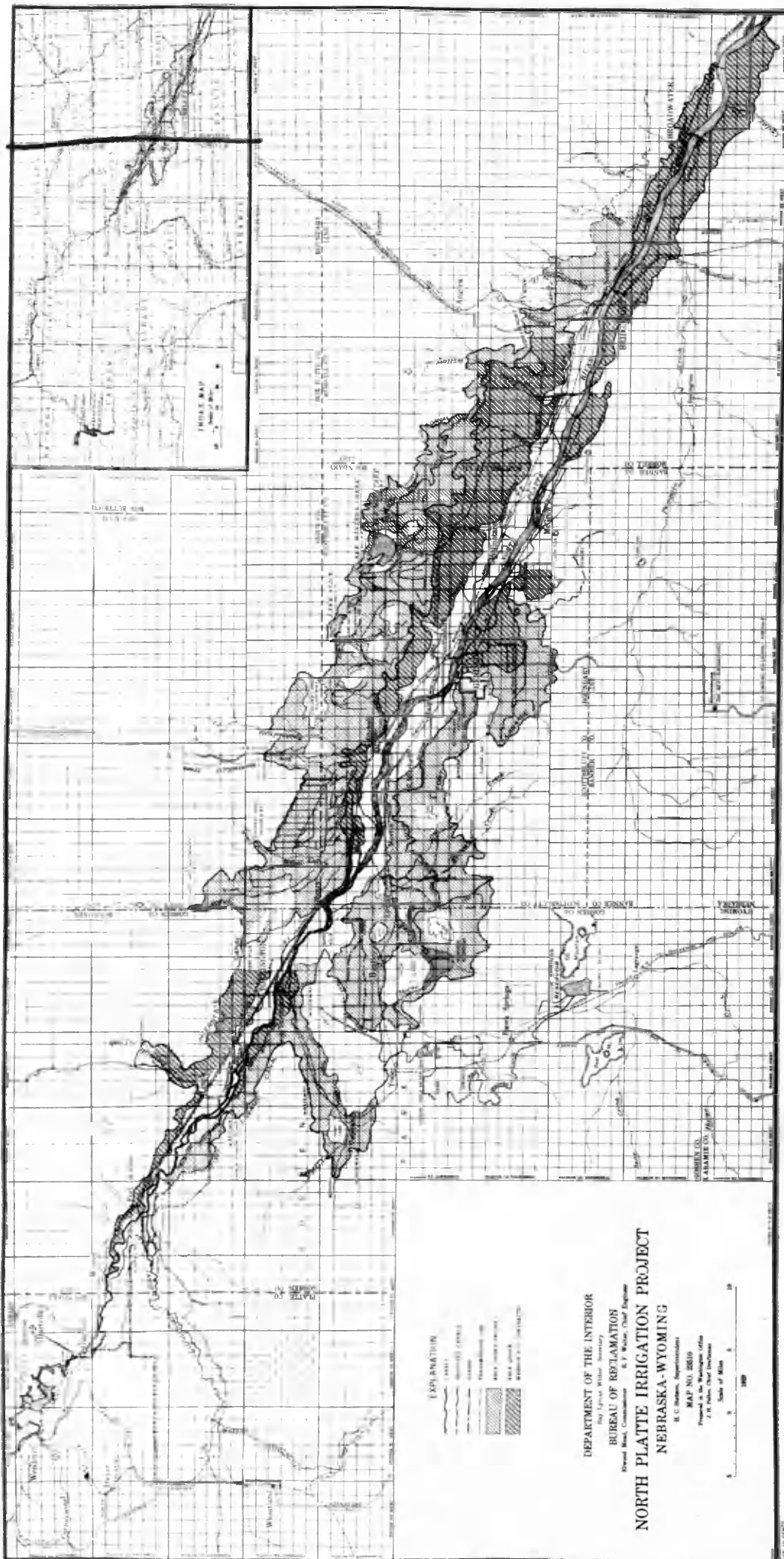
Little thought was given to this problem until the drought of the 1930's. Much of the land which was turned over by the plow has since been returned to grass in the form of alfalfa production. In 1947 in Scotts Bluff County a total of 25,800 acres of irrigated land was devoted to alfalfa production. This acreage produced a total of 63,210 tons.<sup>15</sup>

The comparative looseness of the sandy soil soon proved a problem to the irrigators. Before completion of the main Pathfinder Canal the problem of blowing sand was a reality. On April 17, 1910, approximately 200 second feet of water was turned into the Interstate Canal. (See Map No. 3, Page 26.) The water reached the end of the canal on April 20, but already sand had clogged many of the newly prepared laterals and concern was already being shown regarding the light

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<sup>14</sup> Ibid.

<sup>15</sup> Nebraska Department of Agriculture and Inspection, Nebraska Irrigation Statistics, 1945-1948. (Lincoln, Nebraska, 1948.)



Map No. 3.

snowfall in the mountains to the West. The following statement appeared in the Minatare Free Press:

The main canal [Interstate Canal] as well as the larger laterals are all in excellent condition. A number of the small laterals have, however, been filled with sand during the recent wind storms, and will require the cooperative effort of interested farmers to put these smaller laterals in proper working condition for the approaching season.<sup>16</sup>

Snowfall was unusually light during the early part of 1910 within the North Platte drainage basin. This brought a word of caution from the press:

It appears snowfall is unusually light within the North Platte drainage basin. Some report that it is even lighter than it was two years ago which year furnished a smaller run-off than had ever been recorded up to that time.<sup>17</sup>

Here appeared to be warning that some of the bright pictures painted by the promoters of ample water for all might have a dull hue. The Platte, even before irrigation, was known to be erratic in water flow. In 1873 John J. Cozad, the founder of Cozad, Nebraska, was said to have been thwarted a number of times in his efforts to build a bridge across the Platte near Cozad. Depending on the season, the stream was either dry or flooding.<sup>18</sup>

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<sup>16</sup> The Minatare [Nebraska] Free Press and Sentinel, April 22, 1910.

<sup>17</sup> Ibid.

<sup>18</sup> Charles E. Allen, Early History of Cozad and the Surrounding Community, (Cozad, Nebraska, Published by the Cozad Local, 1955.)

Irrigation, especially since the drouth of the 1930's, has moved eastward in Nebraska. The move eastward did, however, have a definite effect on the western counties. It meant changes. The western counties no longer held a monopoly on irrigation.

(On August 26, 1935, the Public Works Administration announced approval of the Tri-County irrigation project. The Kingsley Dam was constructed on the North Platte river in Keith County approximately seven miles north of Ogallala, Nebraska.)

The North Platte River, long a source of water for irrigation in western Nebraska, was to be used for the benefit of other areas and many in the region did not like it. The Lincoln Star commented as follows:

They moved a town and all its grumbling people. They brought 36,000 acres of land and moved out the farms and cattle and haystacks.

They rebuilt a highway and a railroad here.

They plugged the wells, took out the fences, moved the schools, cut down the trees, and are working on the brush.

They endured lawsuits and recriminations.<sup>19</sup>

(The Tri-County irrigation project was the largest project to be attempted in Nebraska.) Its construction meant changes and as in most pursuits change does not come easy. The tiny village of LeMoyne had to be moved, the brush and trees had to be taken from

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<sup>19</sup> Lincoln Evening Star, February 11, 1941.

what would later be the lake bed. It was necessary to relocate the Union Pacific's North Platte Valley line which included thirty-three miles of new route.

Lake McConoughy, named after C. W. McConoughy, is twenty-three miles long and about two miles wide. When the plan was first announced critics of the project suggested it would never fill. George E. Johnson, who was Tri-County's General Manager, stated in 1941:

When the Tri-County project was approved granting us the right to build a project capable of storing two million acre feet of water behind the Kingsley Dam, water records of the state bureau of investigation showed that approximately 2,250,000 acre feet of water annually was flowing down the North Platte. This figure was based on an average flow record over a number of years. The records indicate there would be ample water.<sup>20</sup>

The Tri-County project was born of the dreams of the early pioneers. Almost from the time they settled on the rich table land of south central Nebraska residents of the area around Holdrege and Minden dreamed of harnessing the waters of the Platte River.

These dreams were to be partially fulfilled by 1933 when the Central Nebraska Public Power and Irrigation District was formed to carry out plans of irrigation and power. The germ of this vast project actually appeared in the early 1880's when Joe Hull and the

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<sup>20</sup> Ibid.

Minden Board of Trade looked to the Platte waters for hydroelectricity and industrial development. A few years later, the drouth of 1890 hit the region. Crops dried up and the planning turned to irrigation, with power and industry almost forgotten in the struggle for survival.<sup>21</sup>

In the early 1890's the plan started to take shape in the minds of two men who were to eventually carry prominent roles in the project. George F. Kingsley, Minden banker, and Charles W. McConoughy, Holdrege businessman were long fascinated by the possibilities of irrigation in the area. In the early 1900's McConoughy had noted the abundant growth of wheat in spots where snow accumulated during the winter. Kingsley had long been interested in the industrial potential of the Platte. When these two men joined forces they merged their ideas of irrigation and water power and the idea of Tri-County was born.<sup>22</sup>

In the early 1930's at the height of the depression, McConoughy and Kingsley were aided by Senator George Norris of Nebraska. A federal grant to build the major works including Kingsley Dam near Ogallala was obtained.<sup>23</sup> Obtaining a grant and the starting of construc-

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<sup>21</sup> Lincoln Sunday Journal and Star, July 20, 1958.

<sup>22</sup> Ibid.

<sup>23</sup> Ibid.



tion was only the beginning of the many problems that were to face the builders of the project. Here appeared to be another instance of an idea being conceived in the minds of proud Nebraskans whose conservative nature was well known, but who, perhaps reluctantly, had to turn to Washington for help.

New irrigation projects are never completely popular. Those to be served by the new project display unbridled enthusiasm, but those who already have irrigation view the new project in another light. They see their water supply being taken. (Platte Valley residents accused the district of attempting to steal their water. Out of this fight came a Supreme Court decision that Platte River water could not be diverted out of the Platte watershed.<sup>24</sup> Repeated attempts to get legislative changes on this restriction failed.) This meant a large share of land proposed for irrigation under the project was out of bounds for Platte water. (Later this area, largely in Adams County, turned to irrigation by wells and has benefited from the underground water recharge from the Central District.<sup>25</sup>)

The value of underground water was not omitted in early plans for the project. George Johnson, manager, stated:

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<sup>24</sup> Osterman V. Central Nebraska Public Power and Irrigation District, 131 Neb 356, 268 NW 334.

<sup>25</sup> Ibid.

The records indicated there will be ample water. With the coming of the drouth years, the river's average flow dropped to 1,489,573 acre feet during the ten years 1929-1938. The average from 1934 to 1940 had been less than that - 1,031,872 acre feet.

The studies also showed that by co-ordinating the three districts and storing water in the Kingsley reservoir whenever possible, the district would have sufficient water to operate successfully. The districts prepared and entered into a co-ordinating agreement. [The agreement referred to was between Tri-County, the Platte Valley Public Power and Irrigation District, and the Loup River Public Power District.]

The construction of this dam and the furnishing of cheap power for pump irrigation will in great measure settle the disputes on water between Wyoming and Nebraska. There is 26 plenty of water for all water users if the flood waters are stored.

As irrigation moved eastward the early mistakes of the western irrigators were not repeated. When the first water from the Pathfinder Project was delivered to the farmers there was little knowledge of how to apply the water. Serious mistakes were made. Not so with the Tri-County system. Leonard Wenzl, Agricultural Engineer for the Tri-County, with headquarters in Holdrege, was hired to help the farmers of the dry Platte Valley tableland north of Holdrege. It was his job to help them adjust themselves to irrigation 27 water.

In 1940 two hundred seventy-nine farmers received some supplemental water. This water was direct-flow flood waters diverted from the Platte River by the Tri-County district through the

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<sup>26</sup> Lincoln Evening Star, Feb. 11, 1941.

<sup>27</sup> Evening State Journal [Lincoln], February 14, 1941.

Phelps County Canal. Approximately one hundred percent of the farms in the irrigable area received water in 1941 from the nearly completed system.<sup>28</sup>

A graphic picture of the benefits of irrigation was painted in 1941. The area around Holdrege during 1940 received thirteen inches of rainfall as compared with a normal of twenty-three inches. On dryland fields no corn grew. Where land was Spring watered with some of the Tri-County direct flow, corn made twenty-five to thirty bushels an acre. On farms where additional supplemental water was pumped onto the fields, corn produced fifty to eighty bushels.<sup>29</sup>

Early settlers were told that when water came to the prairies almost anything could be produced. As stated earlier, in the North Platte area, much was made of the area's potential for fruit growing. Farmers in the Tri-County area were encouraged to grow much the same type of crops under irrigation as they had been trying to grow with indifferent success in years past without irrigation. The chief crops in this area are corn, alfalfa, forage crops and some irrigated small grain. Gardens and much needed windbreaks are irrigated where possible.<sup>30</sup>

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<sup>28</sup> Ibid.

<sup>29</sup> Ibid.

<sup>30</sup> Ibid.

In the early years alfalfa was not grown successfully in this region due to the lack of subsoil moisture. Alfalfa roots are long and need plenty of moisture. It is expected that the area will eventually become a large alfalfa producing region and with that, perhaps, a livestock region.

The Burlington Railroad was a major factor in the colonization of the North Platte Valley and so it was of the Tri-County area. Val Kuska, colonization agent for the Burlington said:

The area [Tri-County] possesses the same potentialities for prosperous development as the irrigated North Platte Valley of Scottsbluff county which boasts it is Nebraska's Valley of the Nile! <sup>31</sup>

Senator George Norris predicted a bright future for the area when he put the Jeffrey Canyon powerhouse into operation early in 1941. Commenting on this project he declared:

The greatest satisfaction in a lifetime, when I have to pass beyond the setting sun, will be to know that these natural resources God has given us are being used for all the people. The project's electricity will help bring a better life to Nebraska. Its water will convert the dry soil into flower gardens instead of deserts. <sup>32</sup>

This prediction of the late Senator came true. In 1958 the residents of Gosper, Phelps, Kearney, and Adams county celebrated the twenty-fifth anniversary of the Central District. In the first quarter century

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<sup>31</sup> Ibid.

<sup>32</sup> Lincoln Sunday Journal and Star, July 20, 1958.

the system was developed to its fullest practical expansion.

In twenty-five years the system has irrigated 120,106 acres of land from its own canals and supplemental irrigation for 130,000 acres served by other Platte Valley canals. It has realized three 18,000 kilowatt power plants and 100,000 kilowatts of steam generated power from its newly completed Canady Plant near Lexington. Flood waters have been controlled and stream flow stabilized in the Platte Valley below Lake McConoughy. The recharge of underground water supplies in much of southeastern Nebraska has been a boon to pump irrigation, and the recreational opportunity afforded the people of the area by the project seem to be unlimited.

A visit to the region today shows that, generally speaking, the farmers are utilizing the water to a good advantage. Little waste is indicated and seepage, a problem still plaguing the upper North Platte projects, seems to be held to a minimum. The farm buildings are painted and maintained. On the other side of the ledger, however, it is noted that some fields are being irrigated that no doubt should have been left as prairie. The "blowout" -- where wind blows

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33  
Ibid.

34  
Ibid.

the top soil and leaves the area barren--<sup>35</sup> is still seen, but not to the extent visible in the extreme western section of the state.

(Stream or ditch irrigation, thought for many years to be only for the far western section of Nebraska, has with the completion of the Tri-County moved eastward and has brought with it a new conception of farming.) No longer can the North Platte be considered a property of western Nebraska; instead, it has become the valued property of all sections of the state. It is truly one of Nebraska's greatest resources.

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<sup>35</sup> Trip by the author through the area on September 10, 11, 12, 1958.

## CHAPTER V.

### THE REPUBLICAN VALLEY

Of considerable interest to the irrigation world is the development of the area along the Republican River--referred to as the Frenchman-Cambridge Division. The system, when completed, will extend from Eaders, Nebraska, eastward along the Frenchman Creek and the Republican River to Orleans, Nebraska.) (See Map No. 2, Page 4.) It is located in the high plains region. The area is characterized by extreme ranges of daily and seasonal precipitation and temperature. The amount of rainfall may vary from semi-arid to sub-humid from year to year even though the average annual precipitation is 20 inches. In 1922 less than 15 inches of rain was received in this area while in 1923 nearly 30 inches was received.<sup>1</sup>

During the latter part of the 1800's the settlers moved westward along the Republican River in western Nebraska.) This region, so the settlers thought, had great agricultural possibilities and it was their hope that the prairie could be turned into a successful and thriving farming community. But this, however, was not to happen overnight.

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<sup>1</sup> United States Department of the Interior, Bureau of Reclamation, Frenchman-Cambridge Division Publication, Washington: Government Printing Office, 6 PO 82-8000170.

Investigations by scientists from the University of Nebraska and the Smithsonian Institution revealed the remains of a large Indian village in the Medicine Creek Valley, indicating the area was inhabited by a tribe of agricultural Indians in the 1400's. (The settlers of the 1800's found the same problems facing them that faced these early Indians, i.e., drought and floods.)<sup>2</sup>

(The early white settlers soon discovered the area was not to give up its agricultural wealth without a struggle. Floods, winds, drought, and insect plagues all combined to limit crop production. Many of the early pioneers abandoned their farms after a few years of crop failures and with their dreams shattered returned to their former Missouri and Mississippi Valley farm communities. Those that remained visualized the possibility of irrigation in the region.)<sup>3</sup>

(Early attempts were made to irrigate land in the Culbertson and McCook areas. The Culbertson and McCook systems were successful but other systems failed due to the inadequate water supply and lack of storage facilities.) From time to time floods plagued the area and in 1935 a disastrous flood struck the area and forced farm and business leaders to seek aid in planning and establishing a sound agricultural economy.

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<sup>2</sup> Ibid.

<sup>3</sup> Ibid.



Several severe floods have occurred on the Republican River and its tributaries in the last century. (Of the known floods, those of 1935 and 1947 caused the most damage.) Records of early floods in the Republican River Basin are scarce but investigations made in connection with the 1935 flood indicate that, according to legendary information, a flood of record proportion occurred in 1826. More recent floods occurred in 1903, 1905, and 1923. Flood flows of 1903 and 1915 were the result of general storms which brought most of the tributaries to bank-full stage and above, and damage was most severe along the lower reaches of the river. The flood of 1935, on the other hand, originated in the upper reaches and was caused by a storm of great intensity over the upper portion of the basin on the Arikaree River and South Fork of the Republican River.

Records covering a period of fifty years reveal that reduced rainfall occurs one-fourth of the time. They occurred during the late 1890's, from 1910 to 1914, 1916 to 1922, and during the 1930's. Over a fifty year period, rainfall was less than 15 inches during eight individual years, and less than 10 inches in 1910.

Lack of vegetation has left the land barren and exposed to erosion by wind and water, which has further depleted the soil resources of the

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<sup>4</sup> Ibid.

<sup>5</sup> Ibid.

region. In the 1930's dust storms were frequent and severe. Mr. Robert Swartz, land owner and implement dealer in Hildreth, Nebraska, recalls the dust conditions of the 'thirties, stating that during this period the farmer had to be "more gopher than human being" to survive, pointing out that hardly a day went by but that the air was dust laden.<sup>6</sup>

Nebraska's climate has always been known for its ability to change rapidly. Spring has frequently brought bright crop prospects but often floods or droughts have intervened between planting and harvest to reduce the crops to failure. This has been especially true in the Republican Valley.

The Omaha World Herald, April 25, 1935, carried the following:

Snow in the mountains and rain on the plains brightened crop prospects today in sections parched by last summer's drouth.

Snow fell in the Rocky Mountains, closing highways with huge drifts. Rains, ranging from drizzle to downpours, were welcomed by farmers in Wyoming, Nebraska, Kansas, Oklahoma, and Texas.<sup>7</sup>

But in June this optimism was shattered by one of the most devastating floods in the history of the Republican Valley. An eye-witness report stated:

The Republican River from the air is an awesome thing as I beheld it from a plane.

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<sup>6</sup> Statement by Robert Swartz, personal interview July 26, 1958.

<sup>7</sup> Evening World Herald, April 25, 1935.

Usually a mild-mannered stream, inclined to stay between its narrow, tree-lined banks, today it is a thing gone mad - a monstrous Frankenstein created by nature. Killing people, tearing at railroad tracks, obliterating entire farmsteads, wrecking bridges, drowning livestock, inundating fine farm homes, swashing along buildings - and those it cannot move it craftily attacks by washing away at the foundation.

From the air it was a mile wide Amazon. The fury of the stream is shown by the manner in which the water swells and boils wherever its path is impeded by any sort of barrier. The trees that formerly lined its banks are now merely green punctuations--dotted lines--reminders of the day when the river was on its good behavior.<sup>8</sup>

The flooding during May and June of 1935 resulted in a loss of over \$9,000,000 in the Republican River Basin. In addition to the heavy property loss, including over 20,000 head of livestock, there was an estimated loss of 110 lives. The 1947 flood damaged a smaller area but the losses amounted to \$16,000,000. The amount of damage was larger because property values were higher and greater development had taken place in the valley.<sup>9</sup>

As previously stated there was some early irrigation development in the Republican Valley in the early years but progress and interest was slow in developing. (The flood of 1935 combined with the depression forced the area to take a long look at the problem of flood control.) Land owners at last realized a stable economy could not be maintained

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<sup>8</sup> Evening World Herald, June 1, 1935.

<sup>9</sup> United States Department of the Interior, Bureau of Reclamation, Frenchman Cambridge Division Publication Washington; Government Printing Office, 6 PO 82-8000170.

in an area that was subject to devastating floods. The problem of drouth could no longer be approached through prayer and wishful thinking. Something had to be done. The answer seemed to be: control the Republican and its tributaries, the Frenchman, Red Willow, and Medicine Creek.

In January of 1946 a petition was filed with the Red Willow County Board of Commissioners and the Nebraska State Engineer's Office for the formation of an irrigation district. An election was held on March 28, 1946, and an overwhelming majority of the votes were in favor of the district. Organization was completed on April 8, 1946, when the Red Willow County Board of Commissioners formally declared the district organized and established its boundries.<sup>10</sup>

(Medicine Creek Dam finished in December of 1949 was the first dam to be completed. Then according to the program Enders and Trenton Dams were built. In conjunction with these storage dams, the Bureau of Reclamation built a distribution system which would irrigate over 70,000 acres of land in Hitchcock, Red Willow, Furnas, and Harlan Counties. In addition to the canals, diversion dams were constructed. The Cambridge Division Dam, located approximately two and one-half miles east of Cambridge on the Republican River,

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<sup>10</sup> Ibid.

was the first such structure completed in the Frenchman - Cambridge Division. The Cambridge Canal, which receives water from the Cambridge Diversion Dam received initial water delivery in 1951.<sup>11</sup>

The scope of the project can be seen in these statistics:

	<u>Trenton</u>	<u>Enders</u>	<u>Medicine Creek</u>
Total Height of Dam	144'	103.5'	115'
Crest length	8,900'	2,603'	5,665'
Width at top	30'	30'	30'
Width at bottom	790'	680'	840'
Capacity of outlet	1,000 cfs & 300 cfs.	1,300 cfs	390 cfs
Spillway capacity	133,000 cfs	200,000 cfs	97,800 cfs
Normal capacity of reservoir	122,800 A.F.	44,500 A.F.	40,000 A.F.
Length of reservoir	6 miles	5.5 miles	8.5 miles

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#### Distribution System

Total mileage of canals	245 miles
Total mileage of laterals	236 miles
Total irrigable acreage	67,680 acres
Irrigable Acreage - Frenchman Unit	22,020 acres
Irrigable Acreage - Meeker Driftwood Unit	16,440 acres
Irrigable Acreage - Red Willow Unit	11,990 acres
Irrigable Acreage - Cambridge Unit	<u>17,230 acres</u>
Total Acreage	135,360 acres

<sup>11</sup> Ibid.

<sup>12</sup> Ibid.

The early settlers in this region naturally farmed according to experience gained in the Mississippi Valley. This tendency had not been entirely broken and when irrigation came upon the scene many of these practices still remained. Irrigation has not proved a cure-all for crop failure. In the early days of irrigation development little planning went into the overall program. The farmer was turned loose with his shovel and water, and with a prayer and boots he waded in, and usually came out worse for the experience.

In the Annual Report of Operations of the Frenchman-Cambridge Irrigation Development, James R. Barker, District Extension Engineer pointed out:

It is of utmost importance to the Federal Government, to the state, and to local people that irrigation be developed properly and successfully in this valley. The investment in the lateral system alone will be nearly \$60 an acre. In addition, a large investment will be made for the canals, diversion dams, storage dams, and drains. The irrigation district and the water user will assume the obligation of paying, in forty equal annual installments, the cost of the lateral system and part of the drainage system. The water users cannot pay this obligation unless there is proper use of land and water for maximum continuous production of crops and livestock.<sup>13</sup>

One of the major development problems has been that of changing the attitude and basic thinking of the average farmer with regard to

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<sup>13</sup> Annual Report of Operations Frenchman - Cambridge Irrigation Development Farm - 1950, McCook, Nebraska, p. 9.

the organization of his farm for irrigation. Practically all of the farmers had operated under dry-land farming conditions. When water became available their thinking was still in terms of dry-land methods and yields, with irrigation an insurance against crop failure. But before farmers could become successful irrigators, it was necessary for them to plan their operations on the basis of a controlled delivery of water in order to obtain maximum production.

The natural inclinations of the new irrigation farmers in the Republican Valley was to produce corn--the principal dry-land crop--by the methods practiced many years previous to the availability of irrigation water. They had to be shown the advantages of using the plow, harrow, surface planter, rotary hoe, and cultivator in place of the lister and weeder. They had to learn that to make irrigation pay, soil must be maintained in a high state of fertility. Moreover, other crops, particularly legumes, could be grown and a livestock program<sup>14</sup> could be a valuable complement.

The various local, state, and federal agencies associated with irrigation programs in the upper Republican River Valley recognized the existence of development programs and the need of an educational

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<sup>14</sup> Ibid., p. 11.

program in effecting successful irrigation. They further realized that to bring about successful development from a non-irrigated to an irrigated economy, the mutual cooperation of all groups was desirable and necessary. Hence, the Nebraska Agricultural Extension Service called a meeting of all agencies concerned at McCook in May, 1947.

The purpose of this gathering was to become familiar with each agency's activities and to agree upon a coordinated educational program.<sup>15</sup>

In July, 1948, a three-day training meeting was held at McCook for county agents, Soil Conservation Service technicians, and Bureau of Reclamation personnel. These people were given training in approved and recommended methods of water application. The following February, representatives of all agencies met at Arapahoe and outlined a definite educational program. This included general irrigation meetings, a five-day training conference for actual irrigation, and small meetings where the County agent, Soil Conservation Service conservationist, and Bureau of Reclamation agriculturalist would meet with four or five farmers and endeavor to help them with their irrigation problems.<sup>16</sup>

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<sup>15</sup>  
Ibid., p. 15.

<sup>16</sup>  
Ibid., p. 17.



At meetings in McCook during April and September of 1949 it was agreed to establish a development farm. Development farms have been used for many years in the solution of problems associated with irrigation development. They have been used successfully in the Columbia and the Missouri river basins. The method used in Nebraska, however, differs in that the cooperating agencies neither own nor lease the farms. In the Nebraska plan the agencies selected a farm which the owner-operator agreed to work on a development farm basis. A farm owned by Mac Anderson, one-half mile north of Arapahoe, Nebraska, was selected as the Frenchman-Cambridge Irrigation Development Farm.<sup>17</sup>

The farm is intended to provide a focal point for the coordinated efforts of all groups interested in directing an orderly and profitable transition from dryland farming to irrigated farming.<sup>18</sup>

( Planning, as indicated in the development farm approach, is a far cry from the "hit and miss" procedures of the early days and might possibly portend a bright future for irrigation development in the Republican River Valley. )

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<sup>17</sup>  
Ibid., p. 29.

<sup>18</sup>  
Ibid., p. 30.

## CHAPTER VI.

### THE MIRAGE FLATS AND AINSWORTH PROJECTS

(The most recent irrigation development in western Nebraska is the Mirage Flats Project. The project is located in Dawson, Box Butte, and Sheridan counties in northwestern Nebraska.) Prior to 1884 this area was occupied chiefly by Indians. At that time Dawes county was included within Sioux and Box Butte counties. During that year, however, it was organized from a part of Sioux county,<sup>1</sup> and in 1886 a portion of Box Butte was annexed.

In the summer of 1885 the railroad was built from Valentine to the White River Basin. Upon its completion there was a great influx of people who rapidly took up homesteads and settled the area. The town of Chadron, now vital to this area, was organized on its present location in August of 1885. The estimated population was<sup>2</sup> 1500. Some irrigation took place in the early days of this area mainly from small streams such as the Chadron, Bordeaux, Dead Horse, and Ash Creeks. The amount of water furnished from these streams was<sup>3</sup> relatively small and the acreage irrigated by them was limited.

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<sup>1</sup> Frank A. Hayes, "Agricultural Geography of Dawes County, Nebraska", Annual Report of Nebraska State Board of Agriculture, Lincoln, Nebraska, 1916, pp. 84-85.

<sup>2</sup> Ibid.

<sup>3</sup> Ibid.

In the early days of this region, as in the rest of Nebraska, there generally was little interest in irrigation. The people came to the area with dreams of free land and plentiful crops, but before long they discovered that water was a rarity in the region. Marie Sandoz, in her book, Old Jules, quoted her father as saying water was for crops and cows, not washing.<sup>4</sup>

By 1884 the Mirage Flats region was making progress toward settlement but at the same time drouth had fallen on the region.

Marie Sandoz describes the region in this manner:

By the first of July Mirage Flats was settling up, a covered wagon here, a dugout and square, patient faces of oxen there. Strips of nigger-wool sod lay straight and flat as bands of metal or greened into rows of two-speared, heat curled corn. By now no plough would penetrate the brick-hard soil. Dry-land whirlwinds picked up bits of grass and weeds, tossed them high into the air, dropped them capriciously back upon the prairie, and zigzagged on. Heat dances and illusionary lakes rippled away the noon hours on the whitish horizon.<sup>5</sup>

The settlers looked upon the "Flats" as an ideal farming country and they visioned the possibilities of establishing a community peopled with farmers. The area settled rapidly and by 1885 a homestead was established on nearly every quarter section.<sup>6</sup>

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<sup>4</sup> Marie Sandoz, Old Jules, (Little, Brown and Company, Boston, 1937), p. 33.

<sup>5</sup> Ibid.

<sup>6</sup> W. G. Eickenberger, Early History and Settlement of Mirage Flats.

The early settlers experienced a few years of good crops and immigration was greatly stimulated. Principal crops produced were corn, wheat, oats and potatoes. During the early years the farmers realized yields of thirty bushel corn and twenty-five bushel wheat. This caused farming to be rapidly expanded, the result being prairie sod was broken in an ever widening area. A severe drought in the late 1880's put an end to the rapid settlement. All crops were a total failure in the extremely dry years of 1893 and 1894. Added to the severe drouth came the war between the settlers and the cattlemen. Many settlers sold out far below the purchase price or left mortgages, or the land was abandoned before it was "proved up on".<sup>7</sup>

Mirage Flats, like most of the Sandhill area, has a history written in human toil, sweat and blood. The gold rush to the Black Hills region forced the government to place the Indians on the Pine Ridge Reservation in South Dakota. The Indians, when present, were a menace to the farmer, but after they were eliminated or placed elsewhere the cattleman came to harass the farmer.

Grass was abundant in the region. The first cattle were driven up the old cattle trails from Texas. A little later quality Hereford bulls were shipped in from the east and the ranches began to upgrade

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<sup>7</sup> Ibid.

their herds for the production of quality beef. The land owners that could combine ranching and farming were able to hold out through the drouth periods, but those that were dependent entirely upon farming failed.

The early farmer realized the region would produce with proper moisture, but rain did not appear in the 1880's. Some farmers turned to irrigation as an answer to their problems and formed a mutual irrigation company. They had very little money for construction, but they gathered what materials were needed and donated labor, horses, and scrapers to build an irrigation system. Each farmer furnished labor according to the amount of land he intended to irrigate.<sup>9</sup>

Pepper Creek and Land Canyon had to be crossed. The principal features of the project were a diversion dam near Dunlap; two flumes each about 1,200 feet long; about twenty miles of main canal and a distribution system. There was no provision for storage, and the flow of the Niobrara River during the months of July and August was far below the irrigation requirements for that period. Some water was delivered for a few years but through lack of cooperation,

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<sup>8</sup> Ibid.

<sup>9</sup> Ibid.

the entire "planned" system was never completed. Farmers located at the lower end of the project area received but very little water. The flumes proved too small to carry the amount of water needed and when water was run through them they leaked like sieves. The flume across Pepper Creek finally collapsed and the other, across Land Canyon, was destroyed by a prairie fire. The project was abandoned<sup>10</sup> in 1903 after several of the settlers had lost everything they had.

Remnants of the old diversion dam and the main canal can still be seen. The old diversion dam was constructed with pilings driven down into the stream bed and it contained, from its present appearance,<sup>11</sup> very little concrete.

By 1920 the Mirage Flats area was almost entirely owned by a pair of cattle ranchers who divided their ranch holdings into small units, and brought in a Danish colony from Central Nebraska. These farmers endured many crop failures but hesitated about building an irrigation system because of the unsuccessful ventures of the early<sup>12</sup> settlers.

After the drought period of the 1930's the Mirage Flats Public

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<sup>10</sup> Ibid.

<sup>11</sup> Trip by the author through area, July 12, 13, 1958.

<sup>12</sup> Eickenberger, op. cit.

Power and Irrigation District was organized in 1937 to promote project development. This was too late to get a Public Works Administration grant. Mr. Carl S. Horn of Hay Springs, promoter of the district, then went to Washington and requested an investigation of the feasibility of the project.

13

The project was authorized under the Water Conservation and Utilization Act and was approved by President Roosevelt on April 26, 1940, and provided for construction by the Bureau of Reclamation. Work on the project started on August of the same year. It was originally intended that the project would be constructed with the use of labor furnished by the Works Project Administration. The war, however, intervened and construction was suspended in December, 1942, and the Works Projects Administration was terminated in 1943. Construction work under the Bureau of Reclamation was resumed in May of 1944, when the agency was made responsible for the completion of the project.

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Development of the project was a joint venture of the Bureau of Reclamation and the Farm Security Administration. The Bureau

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<sup>13</sup> Ibid.

<sup>14</sup> United States Department of the Interior, Bureau of Reclamation, Mirage Flats Project, (Washington: Government Printing Office, 1954.)

of Reclamation accepted the responsibility for constructing the Box Butte Dam and Reservoir and the distribution system. The Farm Security Administration, and after July, 1945, the Soil Conservation Service, assumed the responsibility for the purchase of the land, the sub-division of the land into farm units, the development of the land for irrigation, and the sale of the land.<sup>15</sup>

The Farm Security Administration purchased 14,785 acres of land in the fall and winter of 1940-41. The purchase price, averaging twenty-five dollars per acre, was based upon long-time average crops and prices. Development work, consisting of sub-dividing the land into farms, the farms into fields, and the levelling of the land for irrigation began in 1941. Farm irrigation ditches and structures, and farm drains and structures were constructed in such a way as to make irrigation of the land as efficient as possible. Farm development work was resumed in 1944. At the same time construction work was resumed by the Reclamation Bureau and all of the development work was completed in September of 1948.<sup>16</sup>

In the development of the farms the section lines, except on the main traveled roads, were obliterated. The farms were laid out to provide the best possible irrigation usage. Naturally, by this

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<sup>15</sup>  
Ibid.

<sup>16</sup>  
Ibid.



process the farms vary considerably in shape. It is an exception rather than the rule to find a farm on the project that lays in a rectangular shape. Usually, a road, irrigation ditch, or drain forms one or more side of each unit. This method of laying out farms eliminated many waste areas and made possible lower construction costs for the distribution system and the land leveling.

17

During the development of this area the land was farmed with dry land crops. The farms were leased to farmers until the land was ready for sale. If those on the land proved satisfactory as tenants they became eligible to purchase the land. The farmers who sold land to the government were given first opportunity to re-purchase a family-type farm out of land previously owned, providing they planned to stay on the farm and operate it. Preference was given to qualified veterans of World War II for the remaining farms.

18

Thus the Mirage Flats Project was the first completely planned irrigation farm area in Nebraska with not only the irrigation facilities being government created but also the farms and the tenants were selected by the government.)

Looking back to 1941 the prediction made for the project seems to have materialized. The Nebraska State Journal commented:

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Trip by the author through area, July 27, 1958.

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Mirage Flats Project, op. cit.

With construction under way, the Mirage Flats irrigation project in northwestern Nebraska is regarded in official circles as a stabilizer of agriculture and employment. Both John C. Page, Commissioner of the Bureau of Reclamation, and Representative Coffee (Dem. Nebraska), in whose district the \$2,560,000 project is located, takes the view that:

It will rehabilitate an area where there have been frequent crop failures due to drouth.

It will enable the immediate territory to support a large population, which otherwise would be dislodged and forced to join the trek of migrants westward or in some other direction.

It will reduce relief costs, magnified by drouth and migration, thru the provision of jobs for men working on a permanent improvement for distant farm industrial centers where unskilled labor may be required in national defense activities.<sup>19</sup>

(The project as completed provides storage, distribution, and drainage facilities for the irrigation of about 12,000 acres of land on the north bank of the Niobrara River about ten miles south of Hay Springs, Nebraska.) The Box Butte Dam and Reservoir, located on the Niobrara River about ten miles north of Hemingford, Nebraska, provides storage for the project. It also seems to reduce and control the flood flows of the river. The Dunlap Diversion Dam, located about eight miles downstream from the Box Butte Dam, is the diversion structure of the project. Water for irrigation is diverted into the Mirage Flats Canal at this point and flows by gravity to the project lands, located about twelve miles east of Dunlap Dam. The distribution system supplies water to approximately 12,000 acres of

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<sup>19</sup> Nebraska State Journal, [Lincoln], May 17, 1941.

land, which are drained by a system terminating in the Niobrara River below the project land.<sup>20</sup>

The success, or apparent success, of the Mirage Flats Project has been instrumental in encouraging further attempts at irrigation in the area.

#### The Ainsworth Unit

This unit was authorized as an integral part of the Missouri River Basin Project on August 21, 1954 by Presidential approval of Public Law 612.<sup>21</sup> The area is near the northern boundary of the State of Nebraska approximately equidistant from the eastern and western boundaries. The Merritt Reservoir site is in the valley of the Snake River in eastern Cherry County, about twenty five miles southwest of the city of Valentine, Nebraska. The Ainsworth Canal, when completed, will meander east to the irrigable lands which are located in Brown and Rock Counties on tablelands south of the Niobrara River.<sup>22</sup>

Brown County, in which practically all of the irrigable lands are located, had a population of 4,359 in 1890. The high point was

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<sup>20</sup> Report of the Mirage Flats Project, Bureau of Reclamation, Washington, D. C.; Government Printing Office, 1949.

<sup>21</sup> 83rd Congress, 2nd Session, 68 Statute, p. 757.

<sup>22</sup> Report on the Ainsworth Unit, Bureau of Reclamation, Department of the Interior, Washington D. C.; Government Printing Office, 1954.

reached in 1920 with a population of 6,749. The 1950 population<sup>23</sup> was 5,164 or a loss of twenty-three percent since 1920. The area, predominantly composed of dry land farms suffered extensively during the drouth of the 1930's which was the contributing factor in the population decline.

The area is typical of the Sandhill region and its historical background compares with that of the Mirage Flats region. Typical of the Great Plains Region of the central United States, the topography of the Ainsworth Unit area is level, to gently rolling with a gradual slope toward the northeast averaging ten feet to the mile. Along the river valleys are steep slopes, creeks, canyons, and gullies. The dam and reservoir sites are located in the Sandhills Region of Nebraska and the main canal will be in this area. The irrigable lands are situated on relatively level tablelands on the northern perimeter of the sandhills. In general, the topography of these lands is favorable for irrigation development and only light to moderate levelling<sup>24</sup> has been necessary.

The project, when completed, will be small compared with such Nebraska projects as the Pathfinder and Tri-County, but it is an indication of the trend toward utilization of the area for farming.

(The Ainsworth Canal will cross terrain typical of the Sandhills

Region of Nebraska, an area made up of ranges of low grass-covered hills. Over most of the sandhills area, surface and near surface soils are composed of fine windblown sands.<sup>25</sup>

Irrigation in this area is not new. Approximately 2,500 acres in the vicinity of Ainsworth are under irrigation by pumping from wells. The crops produced on these lands have clearly demonstrated the desirability and value of irrigation in this area where rainfall is not dependable and generally inadequate for full crop production. The water supply from this source, however, is limited and is not available to the entire area.<sup>26</sup>

(The Ainsworth Unit is the result of the trend toward bringing marginal farm areas into production through the use of available water supplies.) Its value is yet to be determined.

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<sup>25</sup>  
Ibid.

<sup>26</sup>  
Ibid.

## CHAPTER VII.

### RECREATION

The recreational aspect of the newly irrigated areas in Nebraska has not been overlooked. In a land that once abounded with wild game it has long since been necessary to restrict hunting and fishing and recreational areas were sorely lacking in the area.

As late as 1900 wild fowl in great numbers were seen in Nebraska. Mrs. L. N. (Sarah E.) Johnson of Cozad, stated:

In the early days (1900) there were a lot of wild fowl including geese, ducks, cranes and prairie chickens. In the spring of the year there would be white brants without number together with speckled brants, thousands of ducks and Canada geese as well. In the morning and evening you could look in almost any direction and see several flocks of geese or ducks either going out to feed or returning therefrom. On windy days in the Spring, they would frequently settle in large numbers within 200 yards of the house. In periods of migration, I have seen one huge flock of geese after another interspersed with ducks fly over our house in such numbers that it would require more than one hour for them to pass.<sup>1</sup>

When the settler arrived, and later the Union Pacific, game became scarce. Fish, however, were never numerous in the region.

Mrs. Johnson stated:

Early, there were no bodies of fresh water in which to fish. All fishing had to be done in the Platte River and this was usually done by spearing when the river was going dry.<sup>2</sup>

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<sup>1</sup> Frank M. Johnson, "Early History of Cozad and the Surrounding Community", Cozad, Nebraska, Published by the Cozad Local, 1955.

<sup>2</sup> Ibid.

With the introduction of irrigation and the vital reservoir system a "by product" of improved recreational facilities has come to the area. First came Lake Alice and Lake Minatare in the Interstate Canal system of reservoirs. These remained the only major man-made reservoirs in the western section until construction of the Kingsley Dam north of Ogallala, Nebraska. This dam created a two million acre foot lake known as Lake McConoughy.

Resorts now spot Lake McConoughy on all shores. The State of Nebraska has a number of camp site areas developed and are developing others. On almost any day during the summer months a visitor can see water skiers enjoying their sport, while others fish for the crappie, walleye, pike, or even the lowly carp. All this in the semi-arid area of western Nebraska.

The Nebraska Recreation Guide for 1958, in addition to Lake McConoughy, lists the following reservoirs:

Sutherland	Little
Maloney	Midway
Moran	Gallagher
Box Elder	Plum Creek
Cottonwood	Johnson
Target	Medicine Creek
Snell	Enders
Jeffry	Swanson
Harlan	

Within just a few miles of two transcontinental highways, U.S. 34 and U.S. 30, lies the fabulous reservoir fishing areas of Nebraska. These two major reservoir chains, including more than 12 large re-

servoirs, offer thousands of acres of top fishing waters to Nebraskans and visitors.) In both the Platte and Republican valley reservoir systems, all kinds of fresh water game fish may be found. Black bass, trout, walleyes, Northern Pike, white bass, crappies, and other pan fish, catfish and bullheads are the prizes of reservoir fishermen.<sup>3</sup>

(The location of these reservoirs is shown on Map No. 4,

Page 63.)

Stories of great numbers of wild game of many species, including wild fowl, were prevalent in the early history of this region. Fishing, however, was never good, even in the early days. Mr. Othello C. Baker, age ninety-three, stated that as a young man he could recall the lack of fish in the western streams. He recalled the abundance of fish in the Missouri and in such streams as the Elkhorn and Loup Rivers, but stated the Platte and other western Nebraska streams contained few fish until the State of Nebraska began a stocking program.<sup>4</sup>

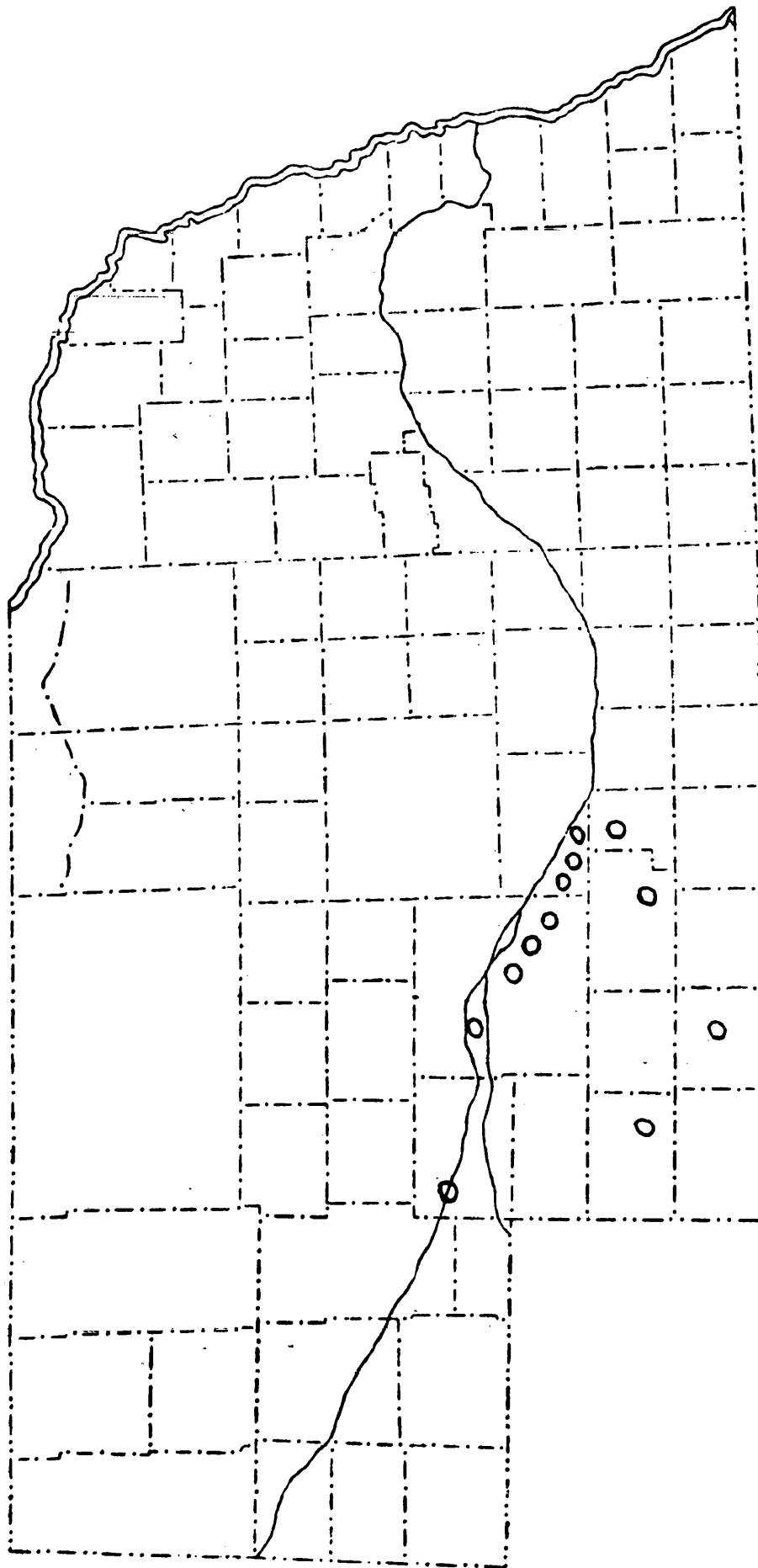
The western section of Nebraska has been known for its sandhill lakes, but, again, these lakes were unstable. A wet year meant full lakes, while a dry year meant that the lakes would disappear almost over night.

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<sup>3</sup> Nebraska Recreation Guide, Nebraska Game Commission, Lincoln, Nebraska, 1958.

<sup>4</sup> Interview, Mr. Othello C. Baker, July 20, 1958.





NEBRASKA  
SCALE OF MILES  
0 20 40 50 80 100

Map No. 4  
Recreational Areas

Today this picture has changed. The once arid west has many man-made lakes interspersed throughout the region. Nebraskans, like many of their eastern neighbors have become water-and boat-minded. The Reclamation Era commented as follows:

Being an admiral in the "Nebraska Navy" used to be a pretty fair joke in a State boasting no sizable body of water.

The irony no longer fits southwestern Nebraska, where watercraft now number in the thousands, and it's a man's own fault if he isn't an admiral, at least in his own household.

Southwestern Nebraska has gone boat-mad, like the rest of the United States, and what makes the mania practical, in the nineteen inch rainfall belt, is the existence of three new reservoirs.<sup>5</sup>

(The three reservoirs mentioned above are the Harry Strunk Lake, covering, 1,768 acres behind Medicine Creek Dam; Enders Reservoir, covering 1,707 acres behind Enders Dam on Frenchman Creek; and Swanson Lake covering 4,974 acres behind Trenton Dam on the Republican River.)

The reservoirs were, of course, constructed for irrigation and flood control, but the need for recreational facilities has always been present in this area. There was, however, a big gap between the existence of bodies of water and the facilities to enjoy them. Adequate roads, drinking water, picnic tables, boat ramps and sani-

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<sup>5</sup> The Reclamation Era, Bureau of Reclamation, (Washington, Government Printing Office, August, 1958, p. 65).

tary facilities had to be constructed. Much of this work was done by the Nebraska Game, Forestation, and Park Commission with planning assistance from the National Parks Service.

Cabin sites have been leased or are available for leasing on the various lakes. Mrs. William C. Nelson of Omaha stated that in 1957 her family leased a fifty foot lake front on Johnson Lake south of Lexington, Nebraska. This lease, for ninety nine years, was purchased for thirty five dollars. Ten dollars per year is paid to Johnson Lakes Development, Incorporated, for the maintenance of roads and area facilities.

The Johnson Lake area is representative of the progress that has been made toward establishing a progressive recreational area in the reservoir areas. A study of the Johnson Lake Directory as of May 15, 1958, showed a total of 465 people who owned lots on the development. The majority of the owners are from the surrounding area but some are shown from the Lincoln and Omaha areas.

Cabin owners on the various lakes have found a certain amount of discomfort connected with their investment in that the level of the water fluctuates almost daily during the summer months. This is

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<sup>6</sup> Ibid.

<sup>7</sup> Interview, Mrs. William C. Nelson, Omaha, October 27, 1958.

<sup>8</sup> "Johnson Lake Directory", Lexington, Nebraska, May 15, 1958.

especially true during the periods of heavy irrigation. On September 11, 1958 a drop of nine inches on the shore line was noted between seven-thirty A. M. and twelve-thirty P. M. This is not uncommon.<sup>9</sup> To offset this problem cabin owners have been forced to build docks extending into the lake as far as three hundred feet. This is now a common practice as the owners realize that the lakes have as their basic purpose the furnishing of water for irrigation and power.

In the early irrigation development such as the Pathfinder Project little planning was done toward furnishing recreational facilities. The newer projects, however, have taken this vital subject into consideration. The Mirage Flats and Ainsworth Unit are examples of projects which have been thoroughly studied with a view toward developing the recreational facilities and resources. Prior to irrigation construction this area presented little or no opportunity for the fisherman. The water in the streams was sediment laden with few pool areas and access roads were scarce. There were a few brown and rainbow trout but these were small in number. It was estimated that the streams in the area received about 525 fisherman days of use in a year.<sup>10</sup>

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<sup>9</sup> Personal investigation conducted on September 11, 1958.

<sup>10</sup> United States Department of the Interior, Fish and Wildlife Service, Fish and Wildlife Resources-Sandhills Division, Nebraska (Washington: Government Printing Office, 1954.)

The impoundment (Merritt Reservoir) will, when completed, provide a valuable recreational area. Facilities such as the Merritt Reservoir provide suitable habitat for trout as well as warm water fish. As a recreational area, however, the region's value will be limited due to the low human population in the surrounding area and the difficulty of access.

Irrigation has in some instances reduced certain types of game animals. Deer, for example, inhabit the low lying brush areas and it is these areas that are usually impounded by the closing of the streams. The use of irrigation, however, has been found to increase such small game as pheasants and rabbits. This is due to the increased acreage devoted to hay and grain crops. The waterfowl population invariably is increased due to the stability of the water area.

A study, as conducted by the government, attempted to place monetary values on the fish and wildlife in the area and evaluated the benefits as shown on Chart Number I, Page 68. The value of the recreational benefits that have come to the irrigated area of the state cannot be disputed. It is difficult to place an actual monetary value on these benefits, but some attempt will be made to do so in the discussion of the economic benefits derived from irrigation.

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<sup>11</sup> Ibid.

<sup>12</sup> Ibid.

## CHART NO. I

ANNUAL FISHING VALUES

<u>Item</u>	<u>Without Unit</u>	<u>With Unit</u>	<u>Difference</u>
Stream fishing in re- servoir area	\$ 600	-	\$ 600
Snake River below Merrit Reservoir	500	\$ 500	
Merrit Reservoir	-	9,700	9,700
	<u>\$1,100</u>	<u>\$10,200</u>	<u>\$ 9,100</u>

ANNUAL WILDLIFE VALUES

<u>Group</u>	<u>Without Unit</u>	<u>With Unit</u>	<u>Difference</u>
Big Game	\$ 500	-	\$ 500
Upland Game	9,600	\$13,900	4,300
Fur Animals	700	600	100
Waterfowl	200	1,100	800
	<u>\$11,000</u>	<u>\$ 15,500</u>	<u>\$ 4,500</u>

FROM: United States Department of the Interior, Fish and Wildlife  
Service, Fish and Wildlife Resources - Sandhills Division, Nebraska,  
Washington: Government Printing Office, 1954.

The comparative low cost of a vacation in these areas makes the region a popular vacation spot not only for families in the area but for residents of the eastern section of the state as well.

In a check of the Sutherland Reservoir area on July 3, 1958 cars were noted from the following counties:

<u>County</u>	<u>Number of Cars</u>
Lincoln	38
Keith	14
Arthur	4
Custer	2
Lancaster	5
Douglas	7
Cherry	1
Cheyenne	1
Logan	1

In addition to the above cars from Nebraska there were three<sup>13</sup> Kansas, two Colorado, one Wyoming, and one Iowa car noted.

On July 4, 1958, on the Otter Creek Camp grounds, on Lake McConoughy, a total of 135 people were camped in tents or trailers. The majority of those present were fishing and boating. The facility at present is only fairly suited to swimming.<sup>14</sup>

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<sup>13</sup> Personal check made by the author July 3, 1958.

<sup>14</sup> Personal visitation made by the author July 4, 1958.

Mr. Gregg Larsen of Scottsbluff, Nebraska, stated that he had camped on the Otter Creek ground for ten days for each of the last three years and had spent on the average of seventy dollars each year. This included food for himself, his wife, and three children, plus fuel for his motor boat and bait for fishing which he purchased in nearby Ogallala. It was his opinion that fishing was better than in Minnesota and, to him, more important, it had proved much less expensive.<sup>15</sup>

The irrigated section of Nebraska is no longer an area devoid of recreational facilities. The State of Nebraska, in making a "pitch" to the tourist says:

The Indian word "Nebraska" is synonymous with "The Great Outdoors". It is here that you find some of the best fishing waters in the United States. In the south-central and western parts of the state are the giant reservoir systems of the Platte and Republican Rivers, top producers of walleye, bass, ring perch, crappie, bluegill, and northern pike.

Nebraska shows great things to the hunter. Geese and duck by the million cross the State borders twice a year. Pheasant is plentiful where adequate cover is available, and quail hunting is becoming a very popular sport.<sup>16</sup>

Granted that some "advertising exaggeration" is probably present in the above excerpt, the fact remains that the once arid region of Nebraska is now populated with many lakes providing opportunity for many and varied recreational pursuits.

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<sup>15</sup>

Interview, Mr. Gregg Larsen, July 5, 1958.

<sup>16</sup>

"Nebraska Welcome Map", Lincoln, Nebraska State Publication, 1958.



## CHAPTER VIII.

### IRRIGATION LAW IN NEBRASKA

The majority of early land laws were enacted to settle the High Plains country with the result being the public lands were thrown open to settlement, exploitation, or speculation.<sup>1</sup> When settlers arrived on the plains and attempted farming the lack of water became apparent. Irrigation seemed a means to sell people on western land. (The drive for legislation to use the disposal of public lands as an aid to irrigation development, produced results: the passage of the Desert Land Act of 1877. Briefly, the law stated a settler might purchase one section of land if he agreed to irrigate it within three years of filing. The purchaser paid twenty-five cents per acre at the time of filing his application and paid an additional dollar per acre upon proof of compliance. Final compliance with the law could be proved at any time within three years, at which time the settler was given title to the land. Only one entry per person was permitted, and no assignments of rights were allowed.)<sup>2</sup>

In 1889 a number of individuals urged that irrigation development be taken over by the federal government or the states. A memorial

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<sup>1</sup> Ray E. Huffman, Irrigation Development and Public Water Policy, New York, The Ronald Press Company, 1953, p. 18.

<sup>2</sup> Roy M. Robbins, Our Landed Heritage (Princeton, N.J.: Princeton University Press, 1942), p. 217.

to Congress from Nebraska in 1891 asked that body to take charge of  
<sup>3</sup>  
 irrigation development.

The west began almost immediately to demand the cession of all arid lands to the states in which they were situated. This movement backed by Congressman from Idaho, Wyoming, and Nebraska obtained the endorsement of the Land Commissioner in his report for  
<sup>4</sup>  
 1891.

(In 1894 the Carey Act was passed which aimed to encourage the investment of private capital, and at the same time to secure protection of settlers against pernicious and ineffectual speculative schemes.) The Carey Act was unimportant as far as irrigation development in Nebraska was concerned. Dr. Robbins points out this fact with the statement that "five years after passage of the Act of 1894, only one western state, Wyoming, the home of Senator Carey, had actually  
<sup>5</sup>  
 developed lands under its provisions".

The drouth of 1890 seemed to stimulate interest in irrigation in Nebraska and direct action was started to get definite laws pertaining to the subject enacted. On February 11, 1891, an irrigation convention

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<sup>3</sup> Ibid., p. 219.

<sup>4</sup> Huffman, op. cit., p. 21.

<sup>5</sup> Robbins, op. cit., p. 329.

was held in Lincoln, Nebraska. At this convention there were delegates in attendance from thirty-six counties. In 1895 the meeting moved westward and was held in Sidney, Nebraska, with two hundred  
<sup>6</sup> twenty-five delegates in attendance. From these early beginnings came the present irrigation laws of Nebraska. Nebraska's basic water laws are similar to those of Colorado and Wyoming and several of the  
<sup>7</sup> other western states in that the appropriative theory prevails. For a time the appropriative theory and the riparian theory were said to be co-existent in Nebraska, but in recent years the riparian theory  
<sup>8</sup> has been virtually abrogated.

The waters of Nebraska's natural streams were used for irrigation and power, and for domestic purposes before Nebraska became a state in 1867. The constitution adopted in 1866 contained no water law. The Common Law of England was adopted by Nebraska in 1867 and it was the only semblance of water law the state had until 1887. In 1887 the legislature extended the provisions of the law relating to internal improvements to empower canal companies to issue bonds and to condemn right of way for canals.<sup>9</sup>

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<sup>6</sup> R. H. Willis, Irrigation in Nebraska, (State of Nebraska Department of Roads and Irrigation, Lincoln, Nebraska), 1950-1951, p. 19.

<sup>7</sup> Appropriative theory - based on theory of exclusive right to the first appropriator.

<sup>8</sup> Riparian rights - gives the owners of land bordering on a stream certain rights not engaged by nonriparian owners.

<sup>9</sup> Dan S. Jones, Jr., "Basic Information on Water Rights and Water Legislation in Nebraska", Speech before Four States Irrigation Council, Denver, Colorado, January 12 and 13, 1956.

The Nebraska legislature in 1889 enacted the St. Raynor Law. This law provided that rights to the use of the water of the natural streams could be obtained by appropriation.) An appropriation could be initiated by posting a notice on the bank of the stream at the point of intended diversion and recording a copy in the office of the County Clerk.<sup>10</sup>

In January of 1956 in a speech before the Four States Irrigation Council in Denver, Colorado, Dan S. Jones, Jr., of Nebraska referred to the Raynor Law and said:

This procedure was sufficient for establishing priorities but it was soon found to be inadequate in that no provision was made for the adjudication or administration of water rights.<sup>11</sup>

In 1895 a water code was adopted patterned to a degree on the law in Wyoming. The law became effective on April 4, 1895. It established the State Board of Irrigation and provided for the appointment of a State Engineer to serve as the administrative official.) The board was given jurisdiction over all matters pertaining to the use of the waters of the natural streams of the State of Nebraska for irrigation,<sup>12</sup> power and other useful purposes.

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<sup>10</sup> Revised Statutes of the State of Nebraska, 1943, Reissue of 1952, Sec. 46-203 to 207.

<sup>11</sup> D. S. Jones, Jr., op. cit.

<sup>12</sup> Nebraska Statutes, op. cit., Chap. 46, Art. 2.

(The 1895 law has continued to be the basic structure of irrigation laws in Nebraska.) Some of its provisions are listed as follows:

1. The water of every natural stream is the property of the public and the right to divert the unappropriated water for beneficial purposes shall not be denied.
2. Priority of appropriation gives the better right as between those using water for the same purpose, but when the waters of any natural stream are insufficient for all those desiring to use it, those using it for domestic purposes shall have the preference over those using it for agricultural purposes, and those using it for agricultural purposes shall have preference over those using it for manufacturing purposes. A water appropriation for power can be interfered with by a junior appropriator for irrigation, provided that "just compensation" is paid to the water user.
3. A water appropriation can be acquired only by the filing of an application for a permit to appropriate water in the office of the State Bureau of Irrigation.
4. Water is appurtenant to the land for which the appropriation was granted and the place of use cannot be changed. When the use ceases the right ceases.
5. The rate of diversion shall not exceed one second-foot for each seventy acres of land actually irrigated and the aggregate annual use is limited to three acre-feet per acre or the least amount of water necessary, under good husbandry to mature a crop. Each appropriator must file an annual acreage report in the office of the State Engineer on or before the first day of April, listing the lands which he intends to irrigate during the year.
6. When the use of water under an appropriation ceases for a period of three consecutive years or more the right is deemed to be forfeited and it may be cancelled upon a hearing before the State Engineer.

7. Water may be appropriated to store in reservoirs for irrigation and other beneficial uses. Water may be stored in a reservoir only when it is not needed for irrigation by direct diversion from the streams, regardless of priority, or for storage in reservoirs with senior appropriations.
8. Water returned to a natural stream from an irrigation project becomes a part of the stream and is subject to appropriation. Return flow, however, and seepage from a project may be reused on the project if it can be interrupted and used before it gets into the stream.
9. The unused water from an irrigation project must be returned to the stream from which it was diverted.
10. Any person intending to construct a dam across the channel of a natural stream or for reservoir purposes must submit the plan to the State Engineer for examination and approval. Construction may not start until such approval is obtained. Stock water dams impounding less than fifteen acre-feet of water to a depth of less than ten feet are exempt, as are erosion control dams less than five acre-feet of water.<sup>13</sup>

Generally speaking the above (ten points are the basis for) present day (irrigation law in Nebraska.) An attempt was made to change the law wherein water from an irrigation project must be returned to the stream from which it is diverted. In the Tri-County case the State Supreme Court upheld this view involving the diversion of water from the Platte River for use on the flat divide between the Platte and the Republican River.<sup>14</sup> A number of unsuccessful attempts have been made to amend the law to change this interpretation and it is the opinion

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<sup>13</sup> Ibid.

<sup>14</sup> D. S. Jones, Jr., op. cit.

of many that this part of the law as written and interpreted will have a serious effect on further irrigation development in the State. Dan S. Jones, in a statement pertaining to this law, said, "If gravity irrigation in the State is to be expanded materially, some further legislation<sup>15</sup> or court decisions in this connection will be necessary".

(Nebraska laws provide for formation of numerous types of districts to construct and operate irrigation, power, flood control, and drainage projects.) The oldest is the Irrigation District Act passed in 1895 as a companion to the irrigation code of that year. Briefly, the law states an irrigation district is initiated by the filing of a petition signed by a majority of the landowners representing a majority of the land in the proposed district. Following a four-week publication of the petition a hearing is held by the county board. If it appears to the county board that the district should be formed an election is advertised and if approved the district may do business. An irrigation district has power to levy taxes and may issue general obligation bonds for the construction and operation of irrigation facilities, to enter into<sup>16</sup> contracts for a water supply, to construct and operate dams and canals.

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<sup>15</sup> Ibid.

<sup>16</sup> Nebraska Statutes, op. cit., Chap. 46, Art. 1.

A majority of the group irrigation enterprises in Nebraska are organized as irrigation districts under this act.

The 1933 State Legislature enacted the Public Power and Irrigation District Act. A district organized under the act may construct and operate irrigation and/or power projects. Such a district has no taxing powers and may issue revenue bonds only.<sup>17</sup> The Central Nebraska Public Power and Irrigation District (Tri-County), the Platte Valley Public Power and Irrigation District are organized under this act.

The Reclamation Act of 1947 states that a petition signed by thirty percent of the electors of a proposed district must be filed with the State Engineer to initiate a district. Such a district may, upon the vote of the electors of the district, levy and collect a tax of one mill on all property within the district pending completion of the irrigation or other works. Thereafter, a levy of two mills may be levied to be used to defray costs of operation and maintenance. A reclamation district may issue both revenue and general obligation bonds upon a vote of the electors.<sup>18</sup>

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<sup>17</sup> Revised Statutes of State of Nebraska, 1943, Reissue of 1950, Chap. 70, Art. 6.

<sup>18</sup> Nebraska Statutes, Reissue of 1952, op. cit., Chap. 46, Art. 5.



In a history of the irrigation laws of Nebraska some mention must be made of the National Reclamation Act of 1902 [Newlands Act]. This act was approved June 17, 1902. The act, although a federal law, assigned the receipts from the sale of the land in the arid states to the construction of storage reservoirs or permanent irrigation works with the water to be distributed under the laws of the states.

Nebraska gained immensely from this act, in that the huge Pathfinder Project in western Nebraska and eastern Wyoming was one of the first to be constructed under its provisions. The passage of the act along with the early irrigation laws of Nebraska opened the door to extensive irrigation in western Nebraska.

## CHAPTER IX.

### THE BENEFITS OF IRRIGATION

Irrigation benefits are project efforts comprising improvements in the general welfare and increases in values resulting from increases in production of goods and service or decreases in the cost of production.<sup>1</sup> Direct farm benefits comprise the increase in family allowance, increased farm income and accumulation of equity in the farm investment. Annual indirect irrigation benefits are derived from the increased profits from sales and processing of increased farm production and from increased purchases of supplies. Public irrigation benefits are derived from increased settlement opportunities, improved investment opportunities, improved community facilities, and from the stabilization of the local and regional economy. Intangible benefits, and other benefits of a public nature which stem from irrigation development are not readily susceptible to monetary evaluation. Such factors as added employment, i. e., hired hands and non-farm workers come under this category.<sup>2</sup>

With this brief explanation of benefits which might be expected to accrue to an irrigated area, a brief history of the North Platte Valley,

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<sup>1</sup> United States Department of the Interior, Bureau of Reclamation, Report on the Ainsworth Project, Nebraska (Missouri River Basin Project), December, 1954, Part I, p. 109.

<sup>2</sup> Ibid.

economically speaking, tells the story.

Scottsbluff County, organized in 1888, has shown a steady population increase. Banner County, immediately below Scotts Bluff County, and organized at approximately the same time, has shown a decrease in population. (See Chart No. II.) As will be recalled, Scotts Bluff County was the county that gained the most from the Pathfinder Irrigation Project under the Reclamation Act of 1902. Banner County, on the other hand, first settled by farmers or "squatters", reverted from farming to mainly a ranching region. Water, in any major amount, has not been delivered to this county and in all probability it will stay a range country.

Lincoln County, where irrigation first gained impetus in Nebraska, also shows a steady population increase. (See Chart No. II.) It is to be noted that McPherson County immediately north of Lincoln County shows an erratic climb and in 1950 a population of only 805 as compared to 401 in 1890. From this it can be safely concluded that irrigation has not only a tendency to increase population but it acts as a stabilizing influence.

To point up the stabilizing influence of irrigation on the economy a comparison between the Lower Platte River Basin and Scotts Bluff County shows a definite stabilizing trend. In the Basin crop production dropped from a high of 134 percent of normal in 1929 to 55 percent in 1936 and remained below normal through the trough of the period 1934 through 1939.

NAME OF COUNTY	DATE ORGANIZED	POPULATION									
		1860	1870	1880	1890	1900	1910	1920	1930	1940	1950
SIoux	1877			669	2,452	2,055	5,599	4,528	4,667	4,001	3,124
SCOTTS BLUFF	1888				1,888	2,552	8,335	20,710	28,644	33,917	33,939
BANNER	1888				2,435	1,114	1,444	1,435	1,676	1,403	1,325
KIMBALL	1888				959	758	1,942	4,498	4,675	3,913	4,283
DAWES	1885				9,722	6,215	8,254	10,160	11,493	10,128	9,708
BOX BUTTE	1886				5,494	5,572	6,131	8,407	11,861	10,736	12,279
MORRILL	1908				631	1,321	4,584	9,151	9,950	9,436	8,263
CHEYENNE	1870		190	1,558	5,693	5,570	4,551	8,405	10,187	9,505	12,081
SHERIDAN	1885				8,687	6,033	7,328	9,625	10,793	9,869	9,539
GARDEN	1909				793	1,275	3,538	4,572	5,099	4,680	4,114
DEUEL	1888				2,893	2,630	1,786	3,282	3,992	3,580	3,330
CHERRY	1883				6,428	6,541	10,414	11,753	10,898	9,637	8,397
GRANT	1887		484		458	763	1,097	1,486	1,427	1,327	1,057
HOOVER	1889				426	432	981	1,378	1,180	1,253	1,061
ARTHUR	1887							1,412	1,344	1,045	803
KEITH	1873			194	2,556	1,951	3,692	5,294	6,721	8,333	7,449
McPHERSON	1890				401	571	2,470	1,692	1,358	1,175	825
*LINCOLN	1860 & 1866		17	3,632	10,441	11,416	15,684	23,420	25,627	25,425	27,380
PERKINS	1887				4,364	1,702	2,570	3,967	5,834	5,197	4,809
CHASE	1886			70	4,807	2,559	3,613	4,939	5,484	5,310	5,176
DUNDY	1873			37	4,012	2,434	4,098	4,869	5,610	5,122	4,354
HAYES	1877			119	3,953	2,708	3,011	3,327	3,603	2,958	2,404
HITCHCOCK	1873			1,012	5,799	4,409	5,415	6,045	7,269	6,404	5,867
FRONTIER	1872			934	8,497	8,781	8,572	8,540	8,114	6,417	5,282
WILLOW	1873			3,044	8,837	9,604	11,056	11,434	13,859	11,951	12,977
THOMAS	1887				517	628	1,191	1,773	1,510	1,553	1,206
LOGAN	1885				1,378	960	1,521	1,596	2,014	1,742	1,357

\*Formerly known as Shorter County

Livestock production followed a similar pattern, declining from a high of 117 percent in 1933 to 77 percent in 1938. By comparison, Scotts Bluff County, showed a relative degree of stability, showing only 10 percent above or below normal or a 20 percent variation. This<sup>3</sup> compared to a variation in the Basin of 75 percent.

These variations become more significant when measured in dollar values. Crop production dropped from \$120,000,000 in the late 'twenties to about \$55,000,000 during the trough of the period, and climbed back to \$120,000,000 by 1945. This farm loss in crop value or production resulted in a loss of about 650,000 animal units and the income from this source was probably cut in half. Because the farms or dependent industries could not support them, counties in the Lower Platte River Basin lost 27,000 people by migration during the period 1930 to 1940, and over 48,000 people left the farms. During this same period, population in Scotts Bluff County increased by 18 percent. This county ranked thirteenth in population growth in the United States during the 1930 to 1940 period.<sup>4</sup>

The far-reaching benefits of irrigation in producing new products for consumption, and in providing markets for manufactured and consumer

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<sup>3</sup> Fred E. Daubert, Reclamation Economist, Statement Before County Agents Training Conference in Lincoln, Nebr., April 20, 21, 1949.

<sup>4</sup> Ibid.

goods which are produced in areas far removed from the local development can be shown by a study of the carloadings of freight forwarded and received at Scottsbluff.

<u>Year</u>	<u>No. of Carloads</u>	
1900	190 Shipped Out	
1910	1300	do
1940	2400	do
1942	3200	do
<hr/>		
1900	280	Shipped In (6 states)*
1910	1450	do (14 do )
1940	6200	do (37 do )
1942	7150	do (39 do ) <sup>5</sup>

\*Number of states from which product received.

It is to be noted the outgoing shipments over the forty-two year period increased 158 percent but that shipments received increased about 246 percent.

(Increased output per acre of land has been proven by irrigation in Scotts Bluff County. Records show that the application of supplemental water when needed results in the difference between 100 and 300

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<sup>5</sup> Annual Report of the Pathfinder Irrigation District, January, 1943, Mitchell, Nebraska.

bushels of potatoes per acre; between 2 and  $4\frac{1}{2}$  tons of alfalfa per acre, and between no sugar beets and 15 tons of alfalfa per acre, and between no sugar beets and 15 tons of sugar beets per acre. The above statistics indicate the advantages that can be expected when supplemental water is available and used properly. The records used in the above study were obtained over a period covering ten to twelve years, and therefore, represent an average of conditions for the period of the experiment.<sup>6</sup>

Increased output adds to the value of the area and this is evident in Federal Tax revenues. The Federal Treasury collects \$16,000,000 annually in excise and income taxes from the irrigated area of the North Platte project. This is \$11,000,000 more than would have been possible without the project according to Commissioner of Reclamation W. A. Dexheimer.<sup>7</sup>

Irrigated land in the North Platte Valley produces thirteen times more per acre in terms of farm products sold off the farm than adjacent dry-farm and grazing lands. In 1954, the gross value of crops grown on irrigated land totaled \$27,900,000 and the cumulative total value since

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<sup>6</sup> Water Resources of Nebraska, Nebraska State Planning Board Report, Lincoln, Nebr. February 1941, p. 91.

<sup>7</sup> Report on Accomplishment of Irrigation, North Platte Project, Department of the Interior, Bureau of Reclamation, Washington: Government Printing Office, January 2, 1956.

1908 is approximately \$454,000,000. Irrigated lands accounted for<sup>8</sup> eighty percent of all crop receipts in the area.

Again comparing Scotts Bluff County and adjacent Banner County the stability of the area is reflected in property values. In Scotts Bluff County ninety percent of all farms are irrigated; in Banner County, only six percent are irrigated. These counties are approximately the same size and agriculture is the chief economy. Scotts Bluff County collected \$3,547,000 in property taxes in 1953 as compared with \$190,000 in Banner County.<sup>9</sup>

The stable economy of the North Platte area, and specifically Scotts Bluff County, is seen in the census figures of 1950. The population of Scotts Bluff County in 1950 was 33,939. This represented a change from 1940 of a plus of one-tenth of one percent. Scotts Bluff County had added few new irrigation developments and its agriculture was well established. Lincoln and Red Willow Counties on the other hand, while adding new projects, increased their population, while other counties in the area lost population. Sioux County, for example,<sup>10</sup> lost 21.9 percent of its farm population. (See Chart No. III.)

<sup>8</sup>Ibid.<sup>9</sup>Ibid.<sup>10</sup>

United States Department of Commerce Statistical Abstract Supplement, County and City Data Book, Washington: Government Printing Office, 1953.



Chart No. III.

<u>County</u>	<u>1950 Population</u>	<u>% of Increases 1940 to 1950</u>
Sioux	3,124	-21.9
Scotts Bluff	33,939	0.1
Banner	1,325	-5.6
Dawes	9,708	-4.1
Chase	5,176	-2.5
Lincoln	27,380	7.7
Red Willow	12,977	8.6
Garden	28,052	5.2
Deuel	3,300	-7.0
Morrill	8,263	-12.4
Cherry	8,397	-12.9

(Irrigation tends to increase industrial production in the area and has a tendency, when the area is fully developed, to reduce the number of farms in the area. Irrigation today is an expensive process and tends to "weed out" the inefficient farmer. ) A study of Chart No. IV<sup>11</sup> and Chart No. V shows this trend.

<sup>11</sup>  
United States Department of Commerce Bureau of Census, 1954  
Census of Agriculture, Vol. 1, pt. 12, Nebraska. Washington:  
Government Printing Office, 1955.

Chart No. V.  
Number Employed in Manufacturing and Agriculture

<u>County</u>	<u>Total Employed</u>	<u>% Mfg.</u>	<u>% Agric.</u>
Sioux	1,201	1.4	73.9
Scotts Bluff	12,375	8.3	25.8 *1
Banner	506	0.4	88.5
Dawes	3,765	3.6	28.4 *4
Chase	2,061	1.1	46.4
Lincoln	10,445	4.0	23.8 *2
Red Willow	5,145	4.1	23.0 *3
Garden	1,556	1.0	53.4
Deuel	1,305	1.5	42.4
Morrill	2,972	3.0	49.7
Cherry	3,128	0.8	53.3

\*1. Scotts Bluff County figures indicate a growing industrial trend. This can only come about through a stable economy.

\*2, 3. Lincoln and Red Willow Counties show a lessening emphasis on dependence of agriculture. New projects and increased business prospects tend to bring industry to the region.

\*4. Dawes County, situated in a typical ranch country has been benefited by increased irrigation as well as being ideally located to serve the Black Hills region.

12  
Chart No. V

Irrigated Farms

<u>County</u>	<u>Irrig. 1950</u>	<u>Irrig. 1954</u>	<u>% Irrigated</u>
Sioux	269	240	45.7 *1
Scotts Bluff	1,657	1,489	85.5 *2
Banner	17	22	8.7
Dawes	63	90	13.3
Chase	29	68	11.1
Lincoln	436	498	31.2
Red Willow	67	104	12.6
Garden	107	119	22.5
Deuel	55	60	14.6
Morrill	539	539	63.1

\*1,2. These figures indicate that in an area where irrigation has been firmly established and has reached a point of stability the number of farms tend to decrease. In areas where added development occurred, such as in Lincoln County, an increase is noted. A large proportion of this area shows an increase in the number of farms from 1950 to 1954 and much of this can be attributed to well irrigation which will be discussed later in the chapter.

The wealth of any farm region can be measured in terms of payroll and equipment. The following chart clearly shows this picture.

13  
Chart No. VI.

<u>County</u>	<u>Number of Autos</u>	<u>Number of Trucks</u>	<u>Number of Tractors</u>	<u>Hired Labor</u>
Sioux	676	617	811	\$ 354,000

12 Ibid.

13 Ibid.

Chart No. VI. (con't.)

<u>County</u>	<u>Number of Autos</u>	<u>Number of Trucks</u>	<u>Number of Tractors</u>	<u>Hired Labor</u>
Scotts Bluff	2371	2006	3215	\$ 2,443,000
Banner	421	538	576	446,000
Dawes	820	558	931	386,000
Chase	685	614	890	317,000
Lincoln	1905	1172	2015	1,038,000
Red Willow	867	655	1080	247,000
Garden	637	565	757	615,000
Deuel	391	420	462	170,000
Morrill	980	830	1275	723,000
Cherry	1054	823	1397	1,382,000

Since it is definite that irrigation tends to increase the population it is obvious the people per square mile will be increased. Chart No. VII shows this as well as indicating the comparative income of individuals within the region.

14

Chart No. VII.

<u>County</u>	<u>Land Area Sq. Mile</u>	<u>People Per Sq. Mile</u>	<u>Personal -- 1949 Family income Median</u>	<u>\$5000 or More</u>
Sioux	2063	2	\$ 2625	14.7%
Scotts Bluff	726	47	2943	16.7

<sup>14</sup>  
Ibid.

Chart No. VII. (con't.)		Personal -- 1949		
County	Land Area Sq. Mile	People Per Sq. Mile	Family in- come Median	\$5000 or More
Banner	738	2	-	-
Dawes	1389	7	2813	14.9
Chase	894	6	2525	15.9
Lincoln	2523	11	3025	17.4
Red Willow	716	18	2939	17.2
Garden	1685	2	2319	15.5
Deuel	435	8	3031	19.0
Morrill	1043	6	2645	11.3
Cherry	5982	1	2500	19.8

It should be pointed out that the year 1949 was commonly referred to as a "good year", and that the figures shown in Cherry County are figures representing a year in which cattle raising brought very high returns.

Irrigation has tended to reduce the size of the farm. The Irrigation Act of 1902 provided a 160-acre limitation on the use of water from Federal irrigation projects and this act still stands. This limitation has been under almost constant criticism for the past few years and has gained impetus recently. The Omaha Sunday World Herald quoted Senator Clinton Anderson (Democrat, New Mexico), Chairman of the Senate Irrigation and Reclamation subcommittee as saying:

It should be made clear that in many areas 160 acres will not produce enough to support a family under today's costs for machinery, transportation and labor. In such areas the limitation enables a farmer to starve slowly, rather than starve rapidly.<sup>15</sup>

This same article pointed out that in the early part of the century a 160 acres could provide a farm family with a good living, and it was all that most families could handle. Today, however, with machinery and other farming techniques, a simple family in many parts of the country can farm more land with greater efficiency.<sup>16</sup> It appears that the farms will tend to increase in size and that changes in the law will have to be made.

(Nebraska officials are generally agreed that irrigation has been a stabilizing influence on the economy and will so continue.) Typical of the feeling is the following statement by Rufus M. Howard, Director, Nebraska Department of Agriculture and Inspection:

With irrigation playing an increasingly important role on Nebraska's farms, the state can expect a more efficient, more stable and secure type of agriculture.

Through the development of the state's water resources, Nebraska farmers will be provided with a "cushion" in the periods of deficient rainfall which can be expected to recur. Even in years of normal rainfall, the proper application of irrigation water means extra production.

Greater stability for agriculture inevitably will mean greater stability for the entire state, for Nebraska's economy is firmly

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<sup>15</sup> Sunday World Herald (Omaha), June 29, 1958.

<sup>16</sup> Ibid.

based on agriculture. The added security to crop production through irrigation will further stabilize livestock production, the key to permanent agriculture. In 1948, Nebraska ranked fifth in the surplus marketing of the three red meats, beef, pork, and mutton with a total of 2,277,061,000 pounds. Nebraska was exceeded only by Iowa, Illinois, Texas, and slightly below Missouri. In the marketing of cattle, Nebraska was third, exceeded only by Iowa and Texas.

A glance at the state's cash farm marketings provides a clear indication of the importance of livestock within Nebraska's agricultural economy. In 1948, cash receipts from the sale of crops were \$359,314,000; receipts from the sale of livestock and livestock products were \$701,587,000, or almost twice as much.<sup>17</sup>

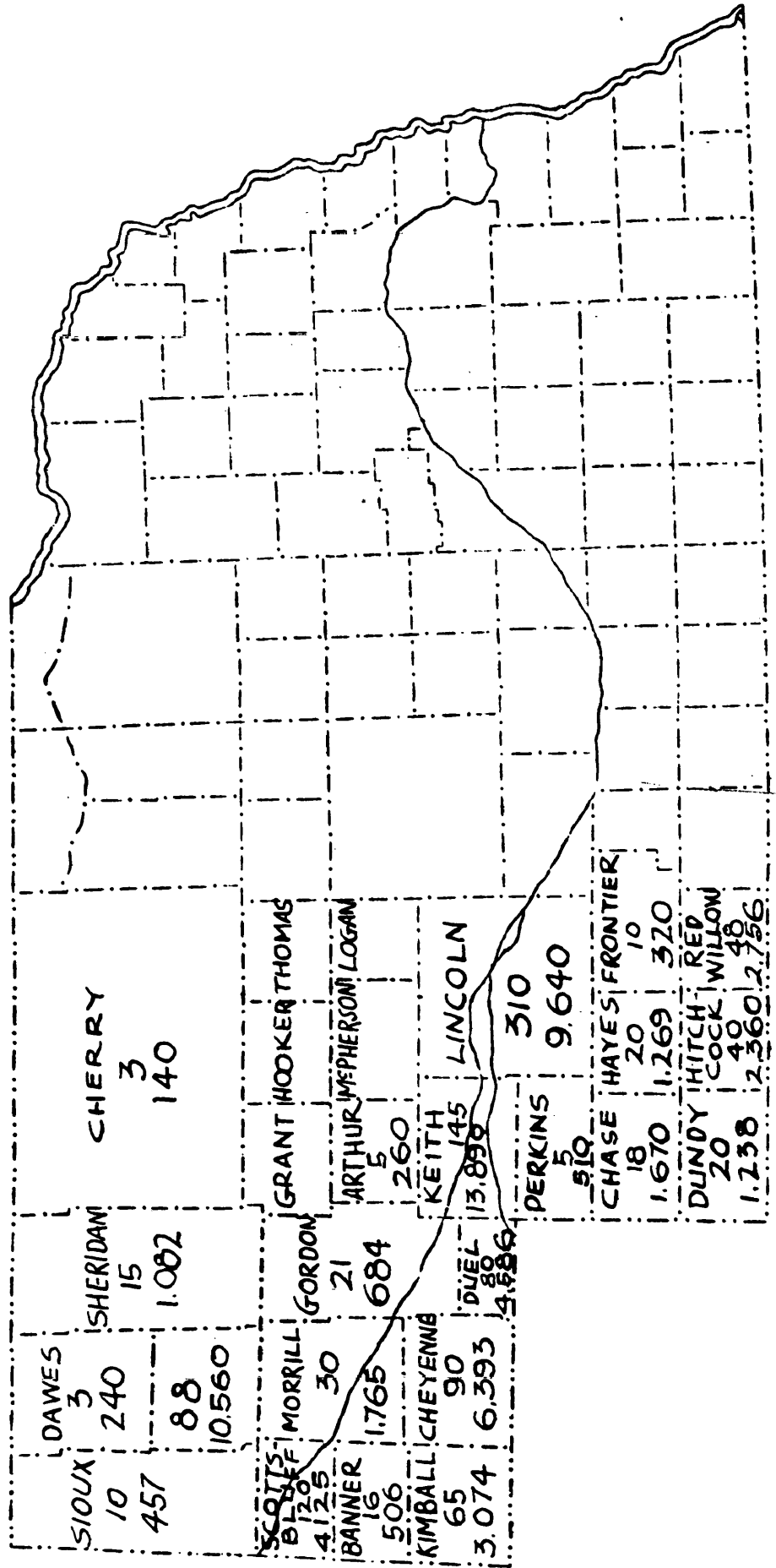
This thesis is a history of irrigation, and fundamentally a story of ditch irrigation. However, it should also be noted that pump or well irrigation is rapidly increasing in Nebraska. The subject of pump irrigation is so vast that it is a suitable subject for a thesis in itself. In order to round-out an understanding of irrigation in Nebraska, perhaps a few words on pump irrigation would be relevant. (Map No. 5, Page 94 shows the number of irrigation wells in the various counties in 1950.)

Difficulties in lifting ground water to the land surface in the early days delayed the utilization of the windmill as a source of cheap water-lifting power. The windmill was hailed as a factor that would permit

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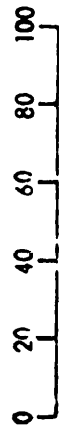
<sup>17</sup> Nebraska Department of Agriculture and Inspection, Nebraska Irrigation Statistics, 1945-1948, Lincoln, Nebraska, 1948, p. p 5, 6.

## IRRIGATION WELLS IN 1950



NEBRASKA

SCALE OF MILES





groundwater use for irrigation purposes but the small amounts involved<sup>18</sup> resulted in making available water for small garden plots only.

The first motor-powered pumps gave considerable impetus to pump irrigation in the state but these pumps were definitely limited in total water lift to depths of 30 feet or less. As a result, groundwater could only be used effectively where groundwater levels were close to the land surface. The advent of deep well turbine-type pumps and motors permitted the production of large quantities of water from increasingly greater depths at progressively smaller cost.<sup>19</sup>

It is estimated that in 1910 there were six irrigation wells in the state; in 1920 about 15 wells; in 1930 about 800; the number of wells in 1940 was about 3000; and the count in 1950 was 7,475 wells. The count in 1956 showed a total of 14,998 wells and as of January, 1958 a total of 22,107 wells were in use. (See Map No. 6, Page 96.)

The increase in wells is apparent and from the map it is readily seen the greater number of wells are located in the eastern central section of the state. With the increase of irrigation wells has come the development of the pump manufacturers within the state. The Irrigation Pump Company of Columbus, Nebraska is an example of this new industry. The firm's pumps are sold under the "Duncan" trade mark in Nebraska, Kansas, Iowa and South Dakota. Leo Sokol, president,

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<sup>18</sup> Nebraska on the March, Vol. IX, No. 1, Division of Nebraska Resources, Lincoln, Nebraska, pp. 2, 3.

<sup>19</sup> Ibid.

[illegible][illegible]

started making pumps in 1932 in Duncan, Nebraska. At the time, he was in the sand and gravel pumping business, but with the drouth setting in, he felt farmers would become increasingly interested in deep well irrigation. He started business in a two-stall garage and now, in Columbus, Nebraska, has approximately 30 thousand square feet of factory space with employment averaging seventy people.<sup>20</sup>

Pump irrigation is expensive. Since there are so many varying conditions in putting down wells, the cost involved is necessarily flexible. To cite a hypothetical example, the cost of a 100-foot well pumping one thousand gallons of water per minute might break down this way:

Drilling and casing - \$9 per foot X 100' =	\$ 900.00
Cost of pump	1,185.00
Motor	1,300.00
	<u>\$ 3,385.00</u> <sup>21</sup>

The use of pump irrigation has grown by "leaps and bounds" but a word of warning has been sounded by irrigation officials. In the October, 1955 issue of Nebraska On The March, E. C. Reed, Director of Conservation, stated:

There is a tendency to overlook an important part of the ground-water program in Nebraska that consists of periodic reading of groundwater levels at a large number of stations located over the state. This is, in effect, a periodic inventory of our ground-water resources....

<sup>20</sup> Ibid., p. 7.

<sup>21</sup> Ibid., p. 8.

Subnormal precipitation and above normal evaporation during day and hot periods cause lowering of groundwater levels as much as ten feet or more but recovery of groundwater levels after favorable periods is very rapid.<sup>22</sup>

This is a warning to pump irrigators that long periods of drouth can adversely affect their water potential just as lack of snow or heavy rains can affect the ditch irrigators' resources.

(Nebraska, as a state, (has unquestionably benefited from irrigation,) but a question of the true value of the projects still exists. The recently completed Ainsworth Project has come under fire recently. Secretary of Interior Fred Seaton had said that all but seven cents of every Federal dollar spent for irrigation and reclamation projects is returned to the United States Treasury. Newly appointed State Engineer, Roy L. Cochran, has disputed these figures stating that the statistics conceal a huge Federal subsidy by excluding interest rates the Government must pay for money it borrows to finance reclamation projects. He contends that only about twenty-five percent of the Ainsworth construction costs would be returned.<sup>23</sup>

Western Nebraska can no longer be called a "desert". Its economic picture is bright at this time but lack of water, poor farm management, and lack of future planning, can change the present picture with tragic effects on all of Nebraska's economy.

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<sup>22</sup> Nebraska On the March, Vol. VIII, No. 1, Division of Nebraska Resources, Lincoln, Nebraska, p. 8.

<sup>23</sup>

Omaha Evening World Herald, December 29, 1958.

## CHAPTER X.

### CONCLUSION

Irrigation, for many years, believed to be needed or necessary in only the arid West, is moving from western Nebraska eastward. In Nebraska it is considered of vital importance in the regions west of the 100th meridian, but only of slightly less importance in the central and eastern sections of the state. Pump irrigation has made the eastern areas "irrigation conscious" and its benefits will soon be utilized in all areas where ground water is available.

In western Nebraska, where irrigation is no longer on a trial basis, its benefits can be evaluated. Irrigation benefits in this region are seen in direct farm, indirect public, and intangible benefits. Direct farm benefits are to be found in increased farm income, and accumulation of equity in the farm investment. Other such benefits result from increased profits from sales and processing of increased farm production and increased farm purchases of supplies. Public benefits are derived from increased settlement opportunities, improved investment opportunities, improved community facilities, and from the stabilization of the local and regional economy. The intangible benefits are those which are not readily susceptible to monetary evaluation. These include diversified farming potential, increased employment possibilities, and recreational opportunities.

That these benefits have accrued to western Nebraska there can be no question. The western Nebraska "Great American Desert" has blossomed under the irrigation program. Communities such as Scotts Bluff have, in a few short years, grown and prospered and stand ready to challenge the cities of eastern Nebraska as to population and wealth. Floods have been controlled, huge reservoirs built, and with them opportunities for recreation have been provided. All of this has been a "boon" to western Nebraska and for the state in general.

Irrigation has not, however, been a community project or even a state product. The early attempts to finance mutual companies were less than successful. The major irrigation projects were creations of the federal government. Federal tax money was used to build these improvements. To have had the federal government involved in projects of such magnitude in the State of Nebraska, and with hardly one outcry of Socialism, is an anomaly. Conservative Nebraskans frequently spoke of the TVA as socialistically inspired, but generally speaking, could see nothing wrong with the federal government stepping in to assist them with irrigation, flood control, and power development.

The need for flood control and the consequent saving of the soil justifies the projects to some extent but as a means to open the land for farming there remains some question as to the national value of

such a move. In many instances the land opened to irrigation has been used to produce crops which are already in surplus and are being subsidized by the taxpayer. This is double cost and with the continued expansion of irrigation the overall cost can only increase.

Some study could well be given to introducing new crops in the irrigated areas and thus reduce the already glutted markets. If, because of the need for flood control, it is necessary to develop these regions, then some thought should be given to eliminating the marginal farmer.

The recent projects, such as the Tri-County project, have instituted training programs for farmers in an attempt to teach them how to utilize water. This type of program should be extended to all projects and some thought should be given to setting up requirements which must be met by all irrigators. Water, used for irrigation, can, if not properly applied, be a destructive force. There is evidence, especially in the North Platte Project of waste and land deterioration due to improper application of water. Delivery of water to farms should be carefully supervised and the use to which the water is put must be controlled.

Nebraska now has a potentially great recreational area in the irrigated areas. This region may, in the future, if handled properly, challenge the resort area of Minnesota. A realistic, business-like

attitude can utilize this area to a greater extent than has been done in the past.

Improved marketing facilities on a world-wide basis can do much to reduce crop surplus and this in turn will make the new farm areas not only more productive but more profitable. Less attention should be paid to the marginal farmer and marginal farm land should not be developed at the expense of the tax-payer.

Nebraska has moved forward with irrigation and it can continue to do so, but Nebraskans must assume more state responsibility in developing further projects or they must expect more federal control. The story of irrigation is far from complete in the area. Its potential has not been fully realized and its future at this time is not completely assured. Extended drouth can weaken and, if prolonged, destroy many of the projects. Too, at the present moment the danger of over-expansion exists. And lastly, and most significantly, there is still the problem of weather -- as to just how irrigation will function in a period of extended drought. (At the present moment it looks as if Major Long was wrong when he called western Nebraska, "The Great American Desert". Nevertheless, it is hoped that man's efforts along the lines of irrigation have done much to bring about a conquest that will change the whole character of the western high plains region.)



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